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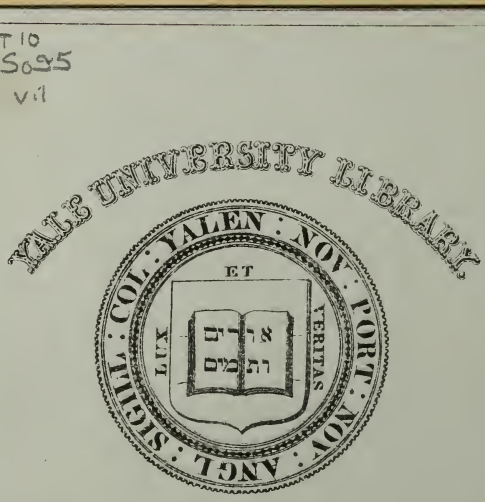

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TRANSACTIONS

OF

THE SOUTHERN SURGICAL AND GYNECOLOGICAL ASSOCIATION

VOLUME I

SESSION OF 1888

BIRMINGHAM, DECEMBER 4TH TO 6TH

ORGANIZED 1887

BIRMINGHAM, ALA.
PRESS OF CALDWELL PRINTING COMPANY.
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NOTICE.

The Committee of Publication, after due consideration, decided that it would not be wise to attempt to include the discussions of papers in the volume of Transactions, since it was impossible to get a satisfactory report of the discussions from the members after they had returned to their homes. Hereafter the Association will have a stenographer, and a full report of all discussions will be preserved.

W. E. B. DAVIS, M. D.,
Chairman Committee of Publication.

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MINUTES OF THE PROCEEDINGS

OF THE

FIRST ANNUAL MEETING

OF THE

SOUTHERN SURGICAL AND GYNECOLOGICAL ASSOCIATION,

HELD IN THE

HALL OF THE YOUNG MEN'S CHRISTIAN ASSOCIATION,
BIRMINGHAM, ALABAMA,

DECEMBER 4, 5 AND 6, 1888.

FIRST ANNUAL MEETING.

FIRST DAY.

TUESDAY, DECEMBER 4, 1888.

Morning Session.

The meeting was called to order at 10 a. m. by the President, Dr. W. D. Haggard. There were in attendance forty-one members and more than fifty visitors.

After an eloquent prayer, by Rev. Dr. D. I. Purser, of Birmingham, Hon. A. O. Lane, Mayor of the city, delivered the following address of welcome:

Gentlemen of the Southern Surgical and Gynecological Association:—Perhaps there is no duty to which the chief magistrate of a city turns with more genuine pleasure from the cares and burdens of official life than that of extending greeting to the city's guests; and, on this occasion, that pleasure is greatly heightened by the presence of a body of men whose lives are devoted to mitigating human suffering and preserving human life. A profession glowing with such benignant aims and illustrated by the heroic self-sacrifice of the great body of its members finds a warm place in the hearts of a generous and appreciative public. Therefore, as the organ of open-handed, warm-hearted Birmingham, I bid you doubly welcome and extend to you the cordial hospitalities of our people.

Though we have not enjoyed a personal acquaintance with many of you, still we view you not in the light of strangers,

but of friends. Birmingham, being the chief railroad centre in the South, and the focus towards which the principal industrial enterprises are pointing, stands in special need of your enlightened science and practice.

Through the aid of her railroads and mines and manufactures, stimulated by her energetic people, she has already become the most wealthy and populous city in Alabama; and unless the future be falsified by the signs of the present, another decade will mark her as the leading mart of commerce and manufacture in the South.

This is no idle hope, born merely of local affection, but a sanguine prediction nursed and nurtured by thoughtful men throughout the United States; this hope is precious to all enlightened and progressive minds, and its full realization and fruition will be the reward of nature's unstinted munificence and the people's untiring energies.

With these well recognized facts, it wonld take much less than their wonted hospitality to stimulate our people to sympathetic and fraternal feelings toward you in your convention of organized thought and action.

The brightest luminary in all the dazzling constellations of nations would soon be overclouded with the darkness of ignorance if it were lighted only by individual and uncommunicated thought.

There is no thinker so profound but that he can reach a greater depth through the stimulus of other minds; there is no genius so luminous but that it can gather new radiance by borrowing gems of thought. And I know of no better means of communicating thought and securing concerted action than for the thinkers and actors to come in close personal contact and communion. The most attentive reader will turn from a printed lecture, which he can buy for a nickel, and pay a dollar to hear it spoken by the author, and consider the investment wisely made. In the first case he sees, but in the second he sees, hears, and feels, and living for the time being with the author he grasps his thoughts, and receives the impress of his mind.

I know you will be edified by your labors, and interested by our mineral resources and industrial enterprises. When not actively engaged in the discharge of your duties, I trust you will view the busy scenes of our growing, bustling city; take excursions to the suburbs, whose beauties I know will charm you, and visit our people at home, and in workshop, counting-house and office, where, on all hands, I can vouchsafe to you a welcome as warm as the sunshine of our genial clime.

The Secretary then read a synopsis of the published minutes of the meeting for permanent organization.

Dr. J. D. S. Davis, chairman of the Committee of Arrangements, reported a most interesting programme prepared by the committee. The Association, however, had to decline a number of excursions, which had been arranged by the committee, as time would not permit of their acceptance.

The President appointed on the Judicial Council, to serve with Dr. J. M. Taylor, of Mississippi (the only member of the Council present): Dr. W. B. Rogers, Memphis, Tennessee; Dr. V. O. Hardon, Atlanta, Georgia; Dr. W. H. Wathen, Louisville, Kentucky, and Dr. W. E. B. Davis, Birmingham, Alabama.

Dr. Bedford Brown then moved that the membership of the Association be limited to *one hundred*. Referred to the Judicial Council.

Papers were then read as follows:

1. The Annual Address of the President, by Dr. W. D. Haggard, of Nashville, Tennessee.

2. "Gastrostomy," by Dr. W. B. Rogers, of Memphis, Tennessee.

Discussed by Dr. W. H. Wathen.

3. "Chronic Pelvic Cellulitis, and the conditions which simulate it," by Dr. Virgil O. Hardon, of Atlanta, Georgia.

Discussed by Dr. Bedford Brown, Dr. Bizzell, Dr. W. E. B. Davis, Dr. Wathen and Dr. Rogers.

4. "The Medical Treatment of Fibroid Tumors of the Uterus," by Dr. Bedford Brown, Alexandria, Virginia.

Discussed by Dr. Hyer, Dr. Hardon, Dr. Bizzell and Dr. J. M. Taylor.

Afternoon Session.

5. "Antiseptic Surgery in Country Practice," by Dr. J. M. Taylor, Corinth. Mississippi.

Discussed by Dr. W. F. Westmoreland, Jr., Dr. Bedford Brown, Dr. Crawford, Dr. Bizzell, Dr. Chew, Dr. Hardon and Dr. Wathen.

6. "A Case of Cut-Throat," by Dr. J. M. Taylor, Corinth, Mississippi.

Evening Session.

The Annual Oration was delivered by Dr. W. F. Hyer, of Meridian, Mississippi, at O'Brien's Opera House.

After the oration the audience was entertained by the Mendelssohn Club of Birmingham.

SECOND DAY.

WEDNESDAY, DECEMBER 5, 1888.

Morning Session.

Dr. Bedford Brown reported that the Auditing Committee had examined all the accounts and vouchers of the Treasurer and found them correct, with a balance on hand of $445.50.

Under the head of miscellaneous business, there was considerable discussion as to the time to hold the next meeting of the Association, and it was finally decided by a unanimous vote that November would be the most suitable month.

Letters and telegrams were read from Drs. George B. Johnson, Hunter McGuire, W. T. Briggs, T. O. Summers, De Saussure Ford, Robert Battey and others, expressing their regrets at not being able to attend the meeting, and wishing the Association success, etc.

The Judicial Council reported unfavorably on the resolution *to limit the membership to one hundred*, and was sustained by

the Association. The Council, in its report, stated that in its opinion it would not be wise to limit the membership to any specific number, and that the chief result aimed at in the resolution could be attained in another and better way. It recommended that the standard of requirements for membership be fixed so high that only the best men would be eligible. That every applicant for membership should present an original paper on some scientific subject connected with surgery or gynecology, and, in addition, be indorsed by two members and recommended by the Judicial Council, as prescribed by the Constitution.

The following by-laws were adopted on the recommendation of the Council:

BY-LAWS.—ARTICLE XVIII.

Every physician, making application for membership, shall present with his application a paper on some surgical or gynecological subject.

ARTICLE XIX.

No paper shall be read before the Association which does not deal strictly with a subject of surgical or gynecological importance.

ARTICLE XX.

No paper read before the Association shall be published in any medical journal or pamphlet for circulation, as having been read before this Association, without having received the indorsement of the Committee of Publication.

Papers:

7. "Floating Kidney, with Vicarious Menstruation," by Dr. De Saussure Ford, Augusta, Georgia. Read by Dr. Bedford Brown, of Alexandria, Virginia.

8. "The Present Status of Electro-Therapeutics in Gynecology," by Dr. J. R. Buist, Nashville, Tennessee. Read by Dr. W. D. Bizzell, of Atlanta, Georgia.

Discussed by Dr. Rogers, Dr. Glenn, Dr. Hardon, Dr. Wathen and Dr. W. E. B. Davis.

9. "Hysterectomy in Cancer of the Uterus," by Dr. W. H. Wathen, Louisville, Kentucky.

Discussed by Dr. Hardon, Dr. Hyer, Dr. Blanks and Dr. Duncan Eve.

Afternoon Session.

10. "Treatment of Fractures with Plaster of Paris Splints," by Dr. W. F. Westmoreland, Jr., Atlanta, Georgia.

Discussed by Dr. W. O. Roberts, Dr. Rogers, Dr. Duncan Eve, Dr. J. H. Blanks, Dr. J. H. Letcher, Dr. Hyer, and Dr. W. Locke Chew.

11. "Laceration of Perineum and Rectocele," by Dr. J. H. Blanks, Nashville, Tennessee.

Evening Session.

12. "Operative Procedures in Hypertrophy of the Prostate," by Dr. R. D. Webb, Birmingham, Alabama.

Discussed by Dr. J. D. S. Davis.

13. "Some Thoughts in Surgery," by Dr. James Guild, Tuscaloosa, Alabama.

14. "Forces Preserving Cerebral Integrity," by Dr. W. Locke Chew, Birmingham, Alabama.

Discussed by Dr. James Searcy and Dr. Bizzell.

15. "Fractures of the Forearm," by Dr. John Brownrigg, Columbus, Mississippi.

Discussion postponed till next day.

THIRD DAY.

THURSDAY, DECEMBER 6, 1888.

Morning Session.

Dr. Brownrigg's paper discussed by Dr. Rogers.

16. "Electrolysis in Morbid Alterations produced in the Prostate by Gonorrhœa of the Urethra," by Dr. J. D. S. Davis, Birmingham, Alabama.

17. "Treatment of Certain Forms of Menorrhagia, with report of Cases," by Dr. W. D. Bizzell, Atlanta, Georgia.

Discussed by Dr. Bedford Brown and Dr. Hardon.

18. "Shock of Injury and its Effects," by Dr. John R. Page, Birmingham.

Discussed by Dr. G. G. Roy, Dr. Brown, Dr. Brownrigg and Dr. Rogers.

19. "Intubation of the Larynx," by Dr. J. H. Letcher, Henderson, Kentucky.

The following papers were read by title and are published in the Transactions:

"Indications for Operative Interference in Cerebral Troubles," by T. O. Summers, M.D.

"Antiseptics in Surgery and Gynecology," by F. T. Meriwether, M. D.

"Practical Aseptic Surgery," by J. W. Long, M.D.

"New Treatment of Intra-Uterine Fibroids," by E. J. Beall, M. D.

"Interesting Cases of Surgery," by R. M. Cunningham, M. D.

"Cystoscopic Explorations," by A. V. L. Brokaw, M. D.

"The Field and Limitation of Laparotomy," by I. S. Stone, M.D.

"Operative Procedures in Traumatic Epilepsy," by J. T. Wilson, M.D.

"Cerebral Surgery," by De Saussure Ford, M.D.

"Electrolysis in the Treatment of Urethral Strictures," by S. M. Hogan, M. D.

"Dermoid Cysts of the Coccygeal Region," by E. J. Beall, M. D.

Upon motion of Dr. Sholl, the rules of the Association were then suspended temporarily.

Upon motion of Dr. Rogers, Article XV of the By-Laws providing for an annual oration, was stricken out.

The Secretary moved to amend Article XVII of the By-Laws so as to read: "Any member failing to pay his dues for more than one year shall be suspended." Carried.

Upon motion of the Secretary the following resolution was adopted:

"The reading of papers shall be limited to twenty minutes each, except by the consent of the Association."

The Judicial Council made its report on the names presented for membership, and the following were recommended by the Council and elected members by the Association. (They were recommended and elected at different times during the session):

J. R. BUIST, M.D., Nashville, Tennessee.
J. H. BLANKS, M.D., Nashville, Tennessee.
J. M. BAILEY, M.D., Greenville, Georgia.
E. J. CONYNGTON, M.D., Decatur, Alabama.
J. M. CRAWFORD, M.D., Atlanta, Georgia.
HUNTER P. COOPER, M.D., Atlanta, Georgia.
J. R. DALE, M.D., Arkadelphia, Arkansas.
W. F. GLENN, M.D., Nashville, Tennessee.
J. W. GRIGGS, M.D., West Point, Georgia.
J. T. JELKS, M.D., Hot Springs, Arkansas.
C. KOLLOCK, M.D., Cheraw, South Carolina.
J. H. LETCHER, M.D., Henderson, Kentucky.
F. W. MCRAE, M.D., Atlanta, Georgia.
R. B. MAURY, M.D., Memphis, Tennessee.
L. S. MCMURTRY, M.D., Danville, Kentucky.
JOHN R. PAGE, M.D., Birmingham, Alabama.
G. G. ROY, M.D., Atlanta, Georgia.
E. H. RICHARDSON, M.D., Cedartown, Georgia.
W. O. ROBERTS, M.D., Louisville, Kentucky.
A. M. STOVALL, M.D., Jasper, Alabama.
W. F. WESTMORELAND, JR., M.D., Atlanta, Georgia.

The election of officers resulted as follows:

President, Dr. Hunter McGuire, Richmond, Virginia; Vice-Presidents, Dr. W. O. Roberts, Louisville, Kentucky, and Dr. Bedford Brown, Alexandria, Virginia.

Dr. W. T. Briggs was elected on the Judicial Council, for a term of three years, to fill the vacancy created by the election of Dr. McGuire to the presidency of the Association.

Dr. Virgil O. Hardon was elected a member of the Council, to fill the place of Dr. Kinloch, whose term had expired.

The President appointed a Committee on Finance, consisting of Drs. W. Locke Chew, H. N. Rosser and R. D. Webb.

Dr. W. R. Rogers and Dr. Virgil O. Hardon were appointed members of the Publication Committee.

Dr. Rosser, chairman of the Committee on a Seal for the Association, was granted more time to make his report.

Dr. Duncan Eve was appointed chairman of the Committee of Arrangements.

Dr. Rogers offered the following resolution, to lie over till the next meeting:

"*Resolved*, That Article V, Section 1 of the Constitution be so changed that the election of officers shall be held at 2:30 p. m. on the second day of the meeting of the Association. All officers shall be elected by ballot. Nominations for each office shall be made."

Upon motion of Dr. Rogers a vote of thanks was tendered the Mendelssohn Club of Birmingham, and the Committee of Arrangements.

A vote of thanks was also tendered the President and Secretary for efficient services.

Upon motion of Dr. Sholl the Association then adjourned, to meet in Nashville, Tennessee, on the second Tuesday of November, 1889.

W. E. B. DAVIS, M. D.,
Secretary.

CONSTITUTION.

ARTICLE I.

The name of this Association shall be "THE SOUTHERN SURGICAL AND GYNECOLOGICAL ASSOCIATION."

ARTICLE II.

The object of this Association shall be to organize the profession of the South in the most efficient manner possible for the advancement of the sciences of surgery and gynecology.

ARTICLE III.

This Association shall adopt and conform to the Code of Ethics of the American Medical Association.

ARTICLE IV.

Any reputable physician, who practices surgery or gynecology, and who is vouched for by two members of the Association, and recommended by the Judicial Council, shall be eligible to membership in this body.

ARTICLE V.

SECTION 1. The officers of this Association shall be, a President, two Vice-Presidents, a Secretary and Treasurer, and a Judicial Council, elected by ballot, without nomination.

SEC. 2. The President and Vice-Presidents shall be elected for one year, and the President shall not be eligible for re-election at any time; the Secretary and Treasurer, each, for

five years, and the Judicial Council as provided for in the By-Laws.

ARTICLE VI.

SECTION 1. It shall be the duty of the President to preside at all meetings of the Association, when present; to give the casting vote; to see that the rules of order and decorum be properly enforced in all deliberations of the Association; to sign the approved proceedings of each meeting, and to approve such orders as may be drawn upon the Treasurer for expenditures ordered by the Association.

SEC. 2. In the absence of the President the first Vice-President shall preside, and in his absence the second Vice-President shall preside.

SEC. 3. In the absence of all three, the Association shall elect one of its members to preside, *pro tem.*

SEC. 4. It shall be the duty of the Secretary to keep a true and correct record of the proceedings of the meetings; to preserve all books, papers and articles belonging to the archives of the Association; to attest all orders drawn on the Treasurer for moneys appropriated by the Association by the seal of the Association; to keep the account of the Association with its members; to keep a register of the members, with the dates of their admission and places of residence. He shall collect all moneys due from the members, and pay to the Treasurer, taking his receipt for the same. He shall report such unfinished business of previous meetings as may appear on his books requiring action, and attend to such other business as the Association may direct. He shall also supervise and conduct all the correspondence of the Association, and be chairman of the Publishing Committee.

SEC. 5. It shall be the duty of the Treasurer to keep a correct record of all moneys received from the hands of the Secretary, giving his receipt for the same; pay them out by order of the Association, as indorsed by the President, and attested by the seal in the hands of the Secretary.

SEC. 6. It shall be the duty of the President of the Association to appoint a Committee of Finance, consisting of three members of the Association, whose duty it shall be to examine the books of the Secretary and Treasurer, and report on the same at the next session of the Association.

ARTICLE VII.

Vacancies occuring in the offices of the Association shall be filled by appointment of the President until the next meeting. He shall also have the appointment of all committees not otherwise provided for.

ARTICLE VIII.

This Constitution shall take effect immediately from the time of its adoption, and shall not be amended except by a written resolution, which shall lie over one year, and receive a vote of two-thirds the members present.

BY-LAWS.

ARTICLE I.

The Southern Surgical and Gynecological Association shall meet annually on the second Tuesday of November, at 10 a. m., at such place as may be designated by the preceding meeting.

ARTICLE II.

The members present shall constitute a quorum for business.

ARTICLE III.

The President shall call the meeting to order; cause the minutes of the previous meeting to be read by the Secretary, which, after correction, shall be adopted.

ARTICLE IV.

The annual dues of each member shall be $10, paid in advance.

ARTICLE V.

The usual parliamentary rules governing deliberative bodies shall govern the business workings of this Association.

ARTICLE VI.

All questions before the Association shall be determined by a majority of the votes present.

ARTICLE VII.

The President shall deliver an annual address at each meeting of the Association.

ARTICLE VIII.

The President shall appoint fifteen members, each of whom shall prepare and read an essay or lecture upon some subject of his own selection; the subjects of said essays or lectures being made known to the Secretary, and by him to each member of the Association, within the first three months after the adjournment of the Association.

ARTICLE IX.

The Secretary of the Association shall receive, at each annual session, a draft from the President, drawn on the Treasurer, for the sum of $100 for services rendered the Association, and to this shall be added the necessary expense incurred in the discharge of his official duties.

ARTICLE X.

It shall be the duty of the Secretary, one month prior to the annual meeting, to notify by circular letters, the members of the Association, and urge their attendance.

ARTICLE XI.

The authors of all voluntary essays shall notify the Secretary, six weeks prior to the meeting, of the titles of their essays, so that they may be incorporated in the circular letter to the members.

ARTICLE XII.

JUDICIAL COUNCIL.

The Judicial Council shall consist of five members; and of those elected at the primary meeting, the first shall serve five years, the second four, the third three, the fourth two, and the fifth one year; so that subsequently one member of the Council shall be elected annually to serve five years.

This Council shall organize by electing a Chairman and Secretary, and shall keep a record of its proceedings.

The duties of this Council shall be—

1. To investigate applications for membership and report to the Association the names of such persons as are deemed worthy.

2. To take cognizance of all questions of an ethical, judicial or personal nature, and upon these the decision of the Council shall be final; *provided* that appeal may be taken from such decisions of the Council to the Association, under a written protest, which protest shall be sustained by the Association, and the matter shall then be referred to a special committee, with power to make final action.

3. All motions and resolutions before the Association shall be referred to the Judicial Council without debate, and it shall report by recommendation at as early an hour as possible.

ARTICLE XIII.

The following are the standing committees of the Association to be filled by the President, and to report at the next annual meeting subsequent to their appointment, viz: Committee of Arrangements and Committee of Publication. The Committee of Publication shall consist of three members, one of whom, the Secretary of the Association, shall also be the Chairman of the said committee. The Committee of Arrangements shall consist of five members.

ARTICLE XIV.

The Committee of Publication shall have full power to omit from the published transactions, in part or in whole, any paper that may be referred to it by the Association, unless specially instructed to the contrary by the Association, which will be determined by vote.

ARTICLE XV.

No honorary members shall be placed upon the roll of this Association.

ARTICLE XVI.

Any member failing to pay his dues for more than one year shall be suspended.

ARTICLE XVII.

Every physician, making application for membership, shall present with his application a paper on some surgical or gynecological subject.

ARTICLE XVIII.

No paper shall be read before this Association which does not deal strictly with a subject of surgical or gynecological importance.

ARTICLE XIX.

No paper read before the Association shall be published in any medical journal or pamphlet for circulation, as having been read before the Association, without having received the indorsement of the Committee of Publication.

ARTICLE XX.

The reading of papers shall be limited to twenty minutes each, except by permission of the Association.

PAPERS READ

AT THE

FIRST ANNUAL MEETING

OF THE

SOUTHERN SURGICAL AND GYNECOLOGICAL ASSOCIATION,

HELD IN THE

HALL OF THE YOUNG MEN'S CHRISTIAN ASSOCIATION,
BIRMINGHAM, ALABAMA,

DECEMBER 4, 5 AND 6, 1888.

THE PRESIDENT'S ANNUAL ADDRESS.

By W. D. Haggard, M.D.,

Nashville, Tenn.

Professor of Obstetrics and Diseases of Women, Medical Department
University of Tennessee.

Gentlemen of the Southern Surgical and Gynecological Association:

Through your kindness I was chosen to preside over the deliberations of this learned assembly. I am grateful to my associates who have so honored me, though I fear it was your generosity, and not my fitness for the responsible position, that prompted the selection from among so many more able and more distinguished members of the Association; but what I lack in ability will in some measure be compensated by my enthusiasm in the cause. Feeling, as I do, that the most capable and ardent among us must fall short of realizing the grand possibilities which await us, I have accepted the trust, with the mental reservation that, if nothing else, I am at least earnest in what I say, and am filled with admiration and hope for the outcome of our labors.

That I am proud of the privilege of addressing you I acknowledge, but I am prouder still of the occasion which calls forth the effort. I know you will sustain me when I claim that Gynecic Surgery, with all its brilliant achievements, owes its present exalted position to the illustrious Sims, no

less than Abdominal Surgery owes its origin to the world-renowned McDowell. The outcome of the labors of these two remarkable men in beneficent results has no parallel in the annals of medicine. They conferred on America the honor of being the birthplace of Gynecology, and did more to alleviate the sufferings, restore the health and prolong the lives of women than any two men living or dead.

To those who knew Sims personally he gave inspiration while he lived, and now that he is dead he has become a tradition; and his teachings, his example, and his labors have passed into history and coupled his name with the practice of an art which will illuminate the ages to come. The first star he won in the galaxy of fame was his success in closing a vesico-vaginal fistula, by which procedure thousands of women have been saved from a life of loathsome suffering and mortification far worse than death, restoring them to their families, their friends, and the social circle which they of all other beings are best calculated to adorn and beautify. This achievement alone entitled him to the baptismal font of Gynecology.

From this point in his life's voyage his reputation spread with the rapidity and brilliancy of a meteor, alike illuminating this and distant lands.

As one star outshines another, so it was given to J. Marion Sims to transcend all of his compeers in the glory of his achievements.

He has written his name so high on the scroll of fame that the whole world may behold it, and so indelibly that all time cannot efface it, and to-day it is as familiar as a household word with every true physician and surgeon on the globe. We deplore his loss—first, because we claimed him as our own; secondly, because he was in the fullness of a ripe and useful manhood, all too soon stricken down and taken from our midst, when, had he been spared to us, we might to-day have expected his presence and his eloquent voice to have welcomed you here, instead of these poor words of mine.

May the light of his genius lend inspiration to us and abide with and preside over our deliberations.

Addressing myself now more directly to those here assembled, many of whom in the midst of urgent professional work have left their homes and loved ones to be present, and participate in the proceedings of the Association, I now, in the name of Alabama, the brightest jewel that stands resplendent in the fair galaxy of States, at one time the home of the illustrious Sims, always the home of advanced thought in medicine and surgery, I bid you welcome to this her city of destiny, to the outstretched arms and open hospitality of the resident physicians and citizens of Birmingham, who greeted many of us on the occasion of our organization a little more than one year ago. I not only welcome you, but I take great pleasure in greeting you, one and all, as leading representatives of a noble and enlightened profession, whose object is to add to the span of human existence by preventing, alleviating and curing the ailments incident to human life.

The presence here of so many distinguished members of the profession sustains the belief, that our present deliberations will aid in advancing the already extensive and ever-extending fields of Surgery and Gynecology, and assist in unfolding the complex problems ever pressing for solution in each of these departments.

The aggregate benefits derived from this sort of professional intercourse is beyond description, but may be feebly outlined by stating that the formal preparation of scientific papers and reports on a great variety of subjects, necessitates a wide range of study and mental discipline, while the individual benefit is found in the collision with other minds in discussions which bring out the salient points of the subject under review in all its varied aspects, thus enlarging the scope of mental vision, giving rise to new trains of thought, begetting a broader and stronger mental grasp, which is heightened by the presence of the great masters of the profession at whose feet we sit and learn, and from whose magnetic influence, emanating from the kindly glance and the warm

shake of the hand, we receive inspiration and take courage from the fact that we meet no more as strangers, but as brothers belonging to the great republic of letters, united in the bonds of scientific interest and affection, with purer and nobler aims.

These advantages are so manifest, that at present, a very large per cent. of the more advanced members of the profession throughout the world participate in organizations similar to ours.

Is it too much to hope that the membership of this organization is already united in bonds of love, which will grow with its growth, and strengthen with its strength, until it receives for itself a domain of usefulness and a place of honor?

The Southern Surgical and Gynecological Association did not spring voluntarily into existence, but was the outgrowth of necessity, and is the embodiment of unknown power.

It was the work of a few energetic minds and hearts that saw its need, and seized the opportunity to give it form and being, which was accomplished in this city the second Tuesday in September, 1887, at a most auspicious moment, and under most favorable circumstances.

We offer to the profession an Association with which you may stand without feeling that you are away from home. It embraces a declaration of principles to which you may all unhesitatingly subscribe. Its face is set in the right direction, with its eyes fixed upon the rising and not the setting sun. It forms a nucleus around which the votaries of science may gather, and as the great republic of letters form the democracy of science whose realms are penetrated by no royal road, but is open on all sides alike to those who with persistent industry, energy and skill, shall ask to join the grand army of scientific observers. So we reach out our hands and invite into our circle such men as have by their works entitled them to the distinction of being educated, talented and industrious workers in the field of scientific research.

This Association has now met for the first time since its organization to lay the offerings of another year's work on

the altar of science, and to further consider the present state of surgery and gynecology, and to contribute its mite in promoting the advancement of each department as a pure science, and their perfection as practical arts.

None, perhaps, will question the supreme and commanding fact that in these two branches of medical science the greatest advances have been made.

To those of us who can look back on a decade of professional life, the improvement that has taken place in that ength of time is very gratifying, and inspires a feeling of hopefulness for the futnre. As much yet remains to be accomplished, we can enter cheerfully upon the work we have undertaken as cultivators of the science and the art of Surgery and Gynecology. We are now young and vigorous. Let us work in the hey-day of youth, that we may keep and add to our strength and influence. Long, then, may this and kindred Associations last, and may our own prove not the least worthy and efficient of them all.

The trend toward specialism, already strong, is continually increasing, and while there is danger that those giving themselves up to special lines of work may become deficient in the fundamental principles of medicine as a whole, there are cogent reasons impelling the movement.

The advent of Sims specially marked an epoch of advancement in this direction, by chasing away many false, though ingenious, theories and dogmas, which were obscured by the fogs of dissension, leaving them to rest in the sunlight of truth.

But, gentlemen of the Association, I am admonished by the number and character of the papers which appear on the programme, as well as by the marked ability of those present who are likely to take part in the discussions, that the time of the Association will be so fully occupied that I have presumed on your approval of the omission of an address on some scientific question, but may have in its stead to ask your indulgence in debate, as well as profit by the discussions.

In declaring the Association now regularly opened for the transaction of business, I must ask your indulgence and generous forbearance with my slender ability in the discharge of the responsible duties which devolve upon me as your presiding officer.

ON THE OPERATION OF GASTROSTOMY, WITH A REPORT OF A SUCCESSFUL CASE.

By W. B. Rogers, M.D.,

Memphis, Tenn.

Professor of Principles and Practice of Surgery, and Clinical Surgery in the Memphis Hospital Medical College.

The patient was a male, white, æt. 24, from Craighead Co., Ark., named Arnold Duke, brought to me by his physician, Dr. T. H. Jones, on the 18th of May, 1888. One year *previous* to that date, he had, through mistake, swallowed about half an ounce of a solution, supposed to have been of concentrated lye, which produced intense burning in his pharynx and œsophagus, with vomiting of blood. Throat was very sore for some days, with great pain and difficulty in efforts at deglutition. He soon went to work, but it was not long before his health began to fail; constant and increasing difficulty was experienced in swallowing solid food, and on three occasions he was totally unable to swallow either solids or liquids; once during a period of five days, again during a period of eight days, and the last time he had not been able to get down anything for ten days, in consequence of which he was so much emaciated and weakened that he fainted from sheer exhaustion on entering my infirmary, where I saw him two hours later, somewhat revived, but scarcely able to sit up without the support of my assistant. A brief history of his case having been obtained, I attempted the introduc-

tion of a bougie. With this instrument a stricture was detected 7½ inches from the incisor teeth. After repeated attempts with various sized instruments, I succeeded in entering the narrowed portion with a No. 6 (American size) urethral gum catheter, with a stylet. Possibly, half an inch, not more, of the catheter entered the narrowed passage. I used pressure very gently, but could pass it no further. The stylet was withdrawn, in the hope that the flexibility of the unsupported catheter would enable it to follow the tortuous canal, but this failed. I then withdrew the catheter, which was tightly clasped by the cicatricial band. A little blood-tinged mucus was spat. Even this slight dilatation afforded some relief, for he found, on trial of water, that he could get a little down into the stomach. Milk was at once substituted, and the night was spent in sipping this food.

The morrow presented us a changed man; the wan, worn and hungered countenance was easy, and even smiled.

The age of this patient, with the history as given, together with the information obtained on my examination, precluded a diagnosis of cancer of the œsophagus, or of intra-thoracic tumor. It seemed clearly to be a cicatricial stricture, the result of the cauterizing fluid drank one year before.

On each of the succeeding six days, catheterization of the œsophagus was attempted—literally speaking—trying all sizes of urethral instruments, down to No. 2 gum catheter. He was very patient, and the search was faithfully made, but to no purpose. On no occasion did I succeed in finding the opening in the stricture. The point of the instrument would come to an abrupt stop, pointing sometimes to the right and again to the left side of the contraction. Very little force was used. On three occasions blood-stained mucus followed the exploration, and each time much pain was produced, which lasted some hours. Swallowing was rendered more difficult during the remainder of the day, on two occasions. He was enabled all the time to get down about three pints of milk in twenty-four hours, by devoting himself closely to the business.

I was forced to give up the hope of practicing dilatation, even with its attendant dangers, because of not being able to find the entrance to the narrow portion of the canal, and advised gastrostomy. Repeated examples of life being sustained for months by rectal feeding have been reported, but it seems that in cases of stricture of the œsophagus, that method of sustaining life does not meet with success. As unpalatable as is the idea of a gastric fistula, it was eagerly grasped at by my patient. He was still able to swallow liquids, and even rice and bread, finely crumbled and cooked in milk; but I advised the operation at once, instead of waiting until he became more emaciated, and was caught, as it were, in a spell of starving. He saw the wisdom of it, and consented.

Nourishment by the mouth was continued, and rectal alimentation, for the first time in his case, was resorted to. Three times in each twenty-four hours one pint of milk, with beef peptonoids was thrown into his bowels.

At the end of three days, May 29, 1888, his bowels having been thoroughly emptied by repeated salt-water enemata, and lastly injected with milk, brandy and beef peptonoids, I began the operation of gastrostomy. My assistants were Drs. T. H. Jones, Henning, Williford, Neely, Dorey and S. A. Rogers. Chloroform was the anæsthetic; time of operation, one hour and ten minutes. Morphia, hypodermically, was used half an hour before anæsthetic was begun, and was repeated at from four to six hours intervals, throughout the first five days. No vomiting occurred during operation, nor until six days afterward, when nausea was caused by the odor of peptonoids.

An incision was made at the site selected by Fenger, that is, parallel with, and one inch from the left costal border. The centre of my incision was on a level with the anterior extremity of the ninth rib. The tissues down to the peritoneum were rapidly cut through, and hæmostatic forceps applied to the few bleeding points, when the peritoneum itself was incised the full length of the wound. Two fingers

were then entered and carried along the under surface of the liver, left lobe, as suggested by Legond, to the spine, where the stomach was found, and after several efforts, brought forward into the upper end of the abdominal opening. Upon repeated trials, a point was selected, which could be fastened to the abdominal wall with least tension on the organ. I then passed two long hare-lip pins parallel with each other, half an inch apart, and transverse to the abdominal wound.

AN ANTERIOR VIEW OF THE PATIENT, PRESENTED IN PERSON TO THE ASSOCIATION, SHOWING THE EXTERNAL OPENING OF THE PERMANENT FISTULA.

They transfixed the peritoneal and muscular tunics, but did not enter the cavity of the viscus; their ends rested on the integument, and thus they held the stomach nicely in the upper angle of the incision. Possibly I should have been

content with this simple apposition of the peritoneal surfaces, as has been practiced by Macnamara, but not knowing how soon the opening in the stomach might be called for, I determined to suture that organ in position, and proceeded to do so after the manner suggested by Greig Smith, and which I will briefly describe.

A straight, flat needle, armed with plaited silk, and devoid of cutting edge, one inch and a quarter in length, was passed beneath the serous and muscular coats of the stomach, and and made to encircle a space of 1½ inches in diameter, inclosing the pins already placed. As this needle was passed it was brought out and reëntered, at intervals of three-quarters of an inch, each time leaving a loop of thread protruding. The circuit having been completed, five loops and a tie presented; by means of a large, rounded needle, armed with double thread, these loops were successively brought directly through the abdominal wall at proper points. A rubber tube was then passed through each of the loops, which were, one by one, tightened, and lastly the tie was brought out and made around the tube. Thus the stomach was riveted, as it were, closely, and by elastic force, to the abdomen; leaving exposed an area about the size of a silver quarter. By the use of a rounded needle there was no bleeding from the peritoneal punctures, and no blood entered the peritoneal cavity during the operation. The lower end of the incision was then closed, the peritoneum being first sewn with interrupted suture, then drainage tube placed, and lastly, silkworm gut sutures closed the muscular and cutaneous layers. Dressings were applied, and the patient put to bed. No evidences of shock were manifested. Pulse never reached 100. Temperature rose slightly on the second day, but fell to normal on the fifth day; never went above 101°. Nourishment was kept up by the stomach and bowels almost from the close of the operation. On the fourth day the pins were removed; on the eighth day the looped sutures were taken out, and rubber tubes removed; on the tenth day, chloroform was administered, and an opening large enough to

admit one-fourth inch drainage tube was made into the stomach. Three days later all the sutures were removed, and on the fourteenth day he was sitting up. On the twenty-sixth day he went home, having been detained several days, while a silver tube with shield was being made.

He left me in good spirits, and able to take a good quantity of milk and rice by the mouth, which was supplemented by feeding through the artificial mouth.

It is now six months since the operation; the patient's general health and strength is perfect. The gastric opening is quite small, and is kept closed by means of this silver tube, which he keeps plugged. He takes nourishment through the natural channel in small quantities, and by care and patience in masticating succeeds, but with difficulty, in getting it down into the stomach. The stricture is about as when he left me, five months ago.

Reviewing briefly the subject of gastrostomy, we learn that the first proposition for this procedure comes from a Norwegian, Egebert by name, as early as 1837. Sedillot first practiced it of his own accord, two years later, performing three operations, the last, probably, in 1853, all three patients dying within a fortnight.

During the succeeding twenty years various operators failed to save a patient, and so unfavorable were the results of the few cases then reported that, in 1864, the great mind of Gross heartily condemned the operation in malignant disease, and could only admit a possible good in non-malignant contractions of the œsophagus.

Erichsen, almost as late as 1873, barely concedes it a justifiable procedure in cicatricial strictures. One year later, 1874, Sydney Jones, after two unsuccessful operations, scores the first success, as published in 1876.

Agnew is most disparaging in his remarks on this subject as late as 1878.

Statistics on this operation, as given four years ago, by S. W. Gross, showed a mortality of 29.47 per cent. in a total of

207 mixed cases. The same report gave a mortality of 29.34 per cent. in 167 operations for cancerous stricture, against 29.72 per cent. in 37 cases of cicatricial stricture of œsophagus. Such figures are rather puzzling, and at the same time suggestive that the cases of cicatricial stricture fell to the hands of novices in surgery, while the malignant cases, with a presupposed unavoidable heavy mortality, fell to the hands of experienced operators, and thus the figures nearly balanced. Gross's figures still further surprise us with the show of the heavier death rate from septicæmia, peritonitis and accidents, when the operation was for cicatricial stricture. The death rate was about equal from shock in the two classes of cases; but, as was naturally to be expected, the mortality from exhaustion and starvation was higher in malignant strictures. On the whole, the death rate at the end of the firat month was 70 per cent. in malignant, against 54 per cent. in non-malignant cases. This 70 per cent. is quite a bad showing, especially when it is remembered that prolongation of life was all that could be hoped for. Few will argue that so grave an operation should be advised for a month's lease of life, which, at best, would be under the worst of circumstances. It is true, the operation itself is the same, whether demanded by malignant or non-malignant cause, but the lowered vitality in later stages of malignancy should come in as a factor in the death rate. Indeed, while the operation is practically so young, it is difficult to draw any just conclusions about its mortality. A death rate based on the first few hundred operations performed helter-skelter by experienced and inexperienced hands, has, in the past, done much to retard the onward progress of many important and life-saving steps in surgery—the operation often suffered, while the fault was with the operator; such was doubtless true of gastrostomy. But at the present writing, so often repeated have been the successes reported, in both malignant and non-malignant cases, that the tide of surgical sentiment has changed, and the operation has a recognized reputable standing among major operations.

The object and aim of the procedure is, in all instances, the prevention of starvation, but writers recognize two classes of cases:

First.—Those where, by reason of the malignancy of the very cause demanding the step, life can, at best, only hope to be prolonged for a very brief space—the wolf only driven from the door, while the jackal within devours the household.

Second.—Cases in which starvation is the sole threatening to life.

In this first class of cases, especially when rectal feeding fails to support, and the pangs of hunger cannot be appeased, I consider it inhuman to withhold the chances of even temporary relief from these sufferers, and it were well not to postpone the step too long. In the latter class the outlook is most cheering, and with the improved aseptic practices and steadily-increasing familiarity with abdominal surgery, the prediction has been ventured that at an early date the mortality will compare favorably with that of oophorectomy.

The operation itself needs next to be considered, and may be described as consisting of three periods: First, the opening of the abdominal cavity; second, finding and fixing the stomach in the opening; third, the opening into the stomach. Of the several lines of incision proposed and practised by various operators, to my mind the choice lies between the vertical incision through the rectus, near the outer border of that muscle, as practised by Howse; and that of Fenger, which was followed in my case, reported above. The incision of Howse will perhaps be awarded the first place, when the stomach can be distended preparatory to the operation, so that the viscus bulges well into the floor of the wound, and all that needs be done is fixing it there. Another great advantage of Howse's line is that the contracting fibres of the rectus form more or less of a sphincter to the fistula—quite a desideratum for the patient's after-comfort; but as in my case,

where dilatation of the stomach was not practical, and that organ had to be searched for, Fenger's incision, perhaps, answered a better purpose for manipulation. It is true, we can get along with a short incision when the organ is distended, but I do not think the extent of the incision within reasonable limits influences the death rate in any abdominal section—plenty of room for the untrammeled performance of the operation is desirable.

The advantage of having a dilated stomach is deprecated by Smith, claiming the worst can be known in regard to tension only when the organ is empty.

In considering the various methods of fixing the stomach in the incision, we are confronted with the question: When will you open the stomach; at once, or will you wait for peritoneal adhesions? Circumstances should govern us in each case. In this age of surgical advancement, instances should be rare where starvation has reached such a point that the rectum cannot be relied upon to support the patient for twenty-four hours. Whenever practicable, the delay of the final step until union has taken place between the stomach and margins of the abdominal opening is, on the whole, a safe course. On the other hand, some operators prefer immediate completion of the operation. Whether such a rule will be universally adopted, experience only will tell.

When delay is advisable, the plan of transfixing the two outer coats with hare-lip pins, is surely the simplest, and the experience of Macnamara tells us, is all-sufficient, but the temptation to render all doubly secure is very great, and few seem able to resist putting in a few stitches—"They often err in doing too much."

If an immediate gastric opening is demanded, the stomach is first carefully stitched to the abdominal opening, preparatory to the final step, which under such circumstances its exceedingly simple; an incision through its outer and middle coats is made, then the inner coat perforated with a small pair of forceps, by means of which a tube is entered and liquid food injected. When several days have elapsed

the entire field is covered by layers of lymph, and some care is requisite not to cut too deeply. In the contracted state of the organ transfixion of both walls might easily occur; hence I incised layer by layer, until the muscular coat was recognized and cut through, then used the forceps. In either instance a large opening is what must be guarded against. Gerster says one of his cases died of starvation, due to escape of gastric contents.

SHOCK OF INJURY.

By John R. Page, M. D.

Birmingham, Alabama

Formerly Professor in the University of Virginia.

I know of no subject which should address itself to the mind of the young surgeon of more importance than this. From the days of John Hunter and Francis Xavier Bichat to the present time "*the shock of injury*" has been considered, and expounded, by the ablest instructors, as a surgical condition of the most vital interest. And yet, the intricate questions that present themselves to the mind of the surgeon attending such cases, often lead to perplexity, for fear that he may do too little or too much. The only safe rule to guide him is a thorough knowledge and observance of the natural history and pathology of such injuries, in their mildest, as well as their severest forms.

In prefacing what I shall have to say further on, I shall, in the main, adopt the description given of "shock of injury" by James Miller, F. R. S. E., in his book on "The Principles of Surgery." He says:

"In the shock of injury more or less depressions of the nervous system, with a secondary and similar result in sanguiferous, is usually the immediate result of mechanical injury, inflicted on the living organism; proportioned in extent to the intensity of the external violence, the amount

of the portion injured, the relative importance of the injured part in the general animal economy, and the previous state of the system of an aggravated character. For example, when a part of a limb has been crushed to a jelly by a heavy weight; when a whole limb has been bruised, scalded or burned; when an internal organ such as the liver, kidney, bowels, lungs, or brain, has in any considerable degree sustained mechanical injury; when an injury not in itself very severe has been done to a frame, either originally weak, or enfeebled by intemperance, previous disease, or either extremity of age.

"In military surgery, as my old comrade will attest, bullet wounds of the trunk are often judged of according to the amount of attendant *shock*. If depression be light and transient, the probability is, that the wound is but superficial, and at all events, that the important internal organs have escaped; if it be both great and protracted, the prognosis is on the contrary unfavorable, the inference being that the wound has reached a vital part.

"*The symptoms of nervous shock* after injury vary from the slightest appreciable syncope; ordinarily the patient lies helpless, cold, shivering, more or less unconscious; and when roused, probably incoherent; convulsions or partial spasms after more twitching may supervene. The pulse is rapid, small, fluttering, indistinct; respiration imperfect, and sighing; nausea and vomiting are common; the latter, often preceding reaction, and seeming to be concerned in its induction; a cold sweat often bedews the shrunk and pale cutaneous surface; the countenance bears a somewhat anxious expression; or else, by entire muscular relaxation, is a vacant death-like blank—the eyes roll listlessly, and anxiously, or else, are fixed in an upward stare, with the upper eye-lids partially closed over the pupils. Often the sphincters are relaxed, fœces and urine seeming to pass involuntarily; sometimes the secretion from the kidneys is suppressed; the cerebral functions become wholly suspended; the heart's action ceases, and existence terminates.

Sometimes such symptoms abate rapidly, reaction quickly commencing and soon becoming completely established; sometimes they persist for hours, reaction coming on late and gradual; not unfrequently reaction fails; sinking is again progressive, *syncope* is complete and life becomes extinct."

To my mind and experience this is an admirable natural history of *shock of injury*. I have therefore adopted it for the useful knowledge that it carries with it. The turning point in the treatment of shock is *reaction*, or a more or less gradual return to a normal condition. As has been said, this is often preceded by nausea and vomiting, an indication that the sympathetic system is aroused. The heart soon indicates that the sanguiferous system is proportionally relieved from depression. By degrees, sensation—power of motion, intellectual function and special sense, gradually return. The patient becomes conscious of his state, and inclines to inquire into it. The secretions and excretions become natural. In this way the patient recovers himself in course of time, and once more becomes an intelligent member of the world around him. This may be the result of nature's effort alone and unaided; or our art may assist in its induction.

However simple the case, the progress of *reaction* should be watched most carefully; for it may overstep the bounds of health, and pass into disease at any moment; as in the case of lesion of certain internal organs, as the brain; the premature occurrence of simple reaction may prove calamitous by the escape of blood from the injured part unfavorable to persistence or resumption of function. Even in ordinary wounds, the progress of reaction must be carefully watched; otherwise inconvenient hemorrhage may ensue. In a merely practical sease, "*shock of injury*" may be considered as of two kinds, viz: Mental and corporeal. In the case of the former, to use the common phrase, the patient is more scared than hurt. Its origin being mental, as soon as the mind has been reassured, the injury being

both seen and felt in truth trivial, the depression passes away and by "*reaction*" the balance of healthful tone is soon established. The one form of shock is in its nature, transient; the other more or less enduring. Of course there are many cases in which both forms of shock are more or less combined, as can be readily imagined. Having stated as briefly as possible the natural history and pathological relations of shock of injury, constituting the principles by which I have been mainly governed in dealing with such injuries, I proceed to give a narration of a few cases, all of which resulted from railway accident.

CASE I.

Occurred in the person of P. H——, age 20 years; occupation, flagman, Georgia Pacific Railway. Date of occurrence, June 2. He is six feet tall, well proportioned, with a frame well set and no superfluous flesh. This man fell 52 feet to the ground, from a caboose car while it was crossing a trestle at a rate of 7 miles an hour, about 1:30 o'clock, a. m., June 2, and was seen by me at 11 o'clock, a. m., being found in the following condition: Incoherent, but evidently in the first stage of *reaction.* I was told that he had made several attempts to vomit. The surface of the body was cool, the face indicated great suffering, the pupils were greatly dilated, great jactitation of the arms and writhings of the body, indicating that the pain was located in the right hip and side. Pulse 90, irregular; heart's action, irregular, and tumultuous, accompanied by a quivering pulsation in both carotid arteries in the neck, and a tremor of the abdominal walls, due to the inordinate action of the abdominal aorta; respiration 26, and irregular; a severe contusion (hœmatoma) over the right hip, with numerous small bruises and scratches over the rest of the body. The bladder was full of urine and there was rigid priapism. Immediately consequent upon this examination as detailed, a hypodermic injection of morphia sulph. ¼ gr., athopia 1.100 gr., was administered,

followed in 40 minutes by another. This boon to the modern surgeon, produced quietness to the whole organism, and enabled me to examine the bony frame thoroughly, with little pain, and revealed the fact that there were no bones broken or joints dislocated.

The urine was drawn off, the patient carefully stripped of his clothing, and the body was sponged from head to foot with equal parts of whisky and water, repeated every hour. At 3 o'clock p. m. the pulse rose to 130, temperature 101° with a tendency to increasing stupor. At 6:40 p. m. the patient was placed on a litter, put upon the train and brought to the city and located in a boarding house. Just before leaving a few tablespoons of milk were given, but it was swallowed with such difficulty that no more was attempted. At 11 p. m, pulse 140, great jactitation of the arms, which was soon quieted by a hypodermic injection of morphia and atropia, the great restlessness and tossing of the arms being an invariable indication that the effects of the hypodermic had passed off; necessitating a repetition of the same every 6 or 8 hours. Ice put in the mouth from time to time was swallowed, but whenever aroused the patient would give utterence to an incoherent "jabber" without consciousness, the result of irritative fever.

June 3, Sunday morning.—Remained in the same condition with delirious jabber whenever free from the effects of morphia and atrophia. Urine drawn off with catheter, nothing given internally, except ice and small quantities of cold water.

June 4, Monday morning.—General condition, with pulse and temperature the same. At 12 m. o'clock an enema of warm water, half a gallon, was let into the rectum by means of a fountain syringe. The whole quantity was retained for four hours, when it was followed by a large solid evacuation passed involuntarily. Immediately after this evacuation of the bowels, of normal character, milk was administered every two hours, and continued, with bovinine or meat juice

alternately given after this. Early in the night the patient recovered for the first time, a partial consciousness, recognizing and calling his brother by name, but soon relapsed.

June 5, Tuesday morning.—The pulse had come down to 108, temperature 101°. From this time I entertained hopes of his recovery, and he continued to improve slowly, but still suffered great disquiet at times, manifested by tossing of the arms, writhing of the body and delirious "jabbering," until quieted by hypodermic of morphia and atropia.

June 6, Wednesday morning.—Condition about the same. Bladder still torpid; urine drawn every 6 or 8 hours; pupils still dilated, but responsive to light of a candle; milk taken regularly.

June 7, Thursday morning. — Much greater restlessness; pulse 120; temperature 102°. A hypodermic injection of morphia and atropia was given, followed by a copious enema, which brought away a large quantity of hardened fœces, followed by quiet rest, largely due to the evacuation of the bowels by the enema.

June 8, Friday, 8:30 a. m.—Pulse 106, temperature 102°. Urine passed involuntarily. From this time hypodermic injections were only given twice in 24 hours; urine also drawn off.

June 9, Saturday morning.—Pulse 104; temperature 101°; urine and fœces both discharged naturally, after calling for assistance, manifesting a marked return of consciousness. Catheter still used, sponging off the body twice a day with whisky and water continued.

June 10, Sunday morning.—Pulse and temperature same. More or less delirious when the effects of the morphia passes off, with return of restlessness; pupils continue to be dilated; food taken regularly in small quantities as allowed.

June 11, Monday morning.—Pulse 100, temperature 100°. Catheter still required for complete evacuation of the bladder, evacuation from the bowels made known in advance.

Morphia injection only given at night; potassium bromide given during the day to quiet restless spells with excellent results.

June 12, Tuesday.—Pulse 100; temperature 100°; general condition much improved; less restless; more conscious; desire to evacuate urine and bowels made known to the attendants; whole body rubbed over as usual, twice a day with whisky and water; with diet of milk in small quantities, frequently repeated during the day, and bovinine at night.

June 13, Wednesday.—Pulse 95; temperature 100°; much less delirium or "idle talk"; urine evacuated naturally; no complaint of pain or soreness, except in the region of the right hip joint; pupils still dilated.

June 14, Thursday.—Condition about the same, with marked improvement, and greater facility of motion, with the "skin reflexes" of tickling the bottoms of the feet, and "crewaster reflex" well manifested, with priapism as a frequent thing, but of much less duration.

June 15, Friday.—Slept well all night; pulse 90; temperature normal; bowels moved naturally; less "idle talk"; enjoys nourishment, and begs for more; one egg, twice a day, added.

June 16, Saturday.—General condition steadily improving, but still some "idle talk."

June 17, Sunday.—Morphia and atropia hypodermic injections omitted the night previous; potassium bromide substituted with good results.

June 18, Monday.—Patient able to sit up, and move the body with considerable ease; the soreness in the hip joint being the only complaint. No idle talk, and consciousness apparently restored.

June 19, Tuesday morning.—At the earnest solicitation of his mother and brothers I agreed to move him to Atlanta on the day train, in the sleeping car, the effects of the "shock of

injury," or "general concussion" of the organism seeming to have been overcome, and the functions fairly restored to their normal condition. The trip was made successfully, without any special medication, except one hypodermic injection of morphia, just before the start, and another when he reached home. The patient was then turned over to Dr. G. G. Roy for further attendance. * * * * * * *

The surgical and pathological interests that attaches to this case are threefold :

(1). That in the fall of 52 feet to the earth, with the train moving at the rate of seven miles an hour, no bones were fractured or joints dislocated. This fact can only be ascribed to the nature of the moist, alluvial earth, upon which the impact of the falling body was expended. For the same reason the "shock of injury" seems to have been *general*, instead of *special;* that is, disseminated over the whole organism instead of affecting any one system, or series of organs more than another.

(2). While the cerebrospinal system, as well as the sympathetic system, was severely shocked for nearly ten hours before *reaction* was manifested, yet the manifestations of great pain, tossing of the hands, writhing of the body, tumultuous action of the heart, pulsation of the carotid and abdominal aorta, with rapid rise in temperature, indicated a reaction in which irritative fever, or a condition involving the general organism, rather than any special set of organs, was included, and these indications called for immediate intervention. Twenty-five or thirty years ago this patient would have been bled from the arm, according to the method of Bouillard's "Coup Sur Coup"—that is small bleedings repeated, until the heart's action was quieted; but acting in the light of the "*living present*," it was deemed best to insert two injections of morphia and atropia at short intervals, under the skin, and to adopt the "expectant plan" of treatment to meet indications as they might arise, which was accomplished with good results.

(3). To substantiate the idea of "general" concussion of the organism and of irritation rather than that of any set of organs of the cerebrospinal mass ; witness, the absence of paralysis of one or more limbs; or of hyperæsthesia, or of anæsthesia, or other phenomena dependent upon the nerves that have their origin in the medulla oblongata, excepting the pneumogastric (parvagum) whose cardiac branches seemed to have been greatly disturbed, as seen in the inordinate action of the heart and of the large vessels. The dorsal and lumbar system of nerves were only partially shocked, because there was entire absence of any loss of sensation, or of motion, with firm retentive power of the sphincters. As before stated priapism was a prominent objective sign, and as it is said, not to be generally manifested in "shock of injury," but to indicate lasceration and irritation of the spinal cord. It was regarded and watched carefully in connection with the other symptoms occurring. However this may be, this symptom existed, with diminution in degree during the whole course of treatment under my charge.

The temperature of the body taken in the axilla soon after quiet was produced by the first hypodermic injection of morphia and atropia was 100°, but soon rose to 102°, at which point it remained for several days. This temperature probably marked the degree of irritative fever and was most probably kept up by vasomotor disturbance of the sympathetic nervous system, rather than that of the spinal cord, as attested in the rapid fall of temperature and pulse after the enema acted.

The dangers to be encountered in the treatment of cases of "shock of injury" of this kind are :

(1). Continued depression, sinking and death.

(2). Inflammation and excessive "reaction" of a sthenic and vascular character.

(3). Excessive reaction, probably of a nervous type.

In the case under consideration, to meet the above indications of treatment from first to last, nothing was given by the

mouth, except ice, and the blandest nourishment, consisting of milk, and beef juice in small quantities, at intervals; except the potassium bromide given late in the treatment, hypodermic injections with morphia and atropia, with sponging the body with whisky and water, being relied upon to support the heart, to keep down the excessive irritation of reaction, and to quiet the nervous system.

Shock of injury or "concussion" meaning literally—"to shake together"—are terms well applied to injuries sustained by the cerebrospinal system, and other viscera, from falls, blows, etc., and may be found to exist in different phases, as exhibited in the following cases, in which loss of consciousness was of much shorter duration than the former.

CASE II.

July 15.—A. McD——— age 29, occupation engineer, fell with his engine through a trestle 25 feet to the bed of a creek, with five cars loaded with coal tumbling in on the engine. Although shocked consciousness was lost only for a short time, and being a man of great nerve, he was soon able to give directions to his rescuers, how best to release him from the wreck that encompassed him. He was seen by me two hours after the accident. His body was so begrimed with coal dust as at first to prevent the recognition of injuries of the surface. Pulse 60; heart's action irregular; respiration prolonged. A severe contusion (without lascer-ation) was found on the back and left side of the head; another over the false ribs of the left side, extending over the whole lumbar region, with tips of the four fingers of the left hand mashed with the nails broken, the most painful of all his injuries at the time. No paralysis, paresis, hyperæs-thesia or anæsthesia discovered. A hypodermic injection of morphia 1¼ gr., atropia 1–100, preceded by a little whisky and water, was given immediately, and the patient conveyed to his home on a litter, where his body was thoroughly cleansed of coal dust with soap and tepid water, with dress-ings applied to the head, loins, and hand, with another

hypodermic injection to insure rest and quiet during the night.

July 14, morning.—Patient rested well; passed some urine during the night, but with difficulty, but with renewed effort, succeeded in evacuating the bladder sufficiently to do away with the necessity of using the catheter. Pulse 100; temperature 101°; great soreness and difficulty of movement and considerable suffering with the fingers of the left hand. An enema of warm water was given and the body directed to be sponged all over with equal parts of vinegar and water three times a day, with milk diet, and perfect quiet in a dark room.

July 15.—Pulse 80; temperature normal; very considerable soreness and pain in the lumbar region on motion, but general condition greatly improved.

July 16.—Steady improvement; able to sit up in bed and use his upper limbs with ease.

July 17.—At his earnest solicitation he was conveyed to the train in a chair and permited to go to Atlanta to his family on a sleeping car, and put in charge of Dr. G. G. Roy.

August 16.—This date he was seen and examined by me, and proved to be able to move about with facility on crutches, with some soreness still remaining over the region of the left side in lumbar region, extending to the left hip joint.

CASE III.

Irvin Strozier, negro fireman, age 33, robust and powerful man, fell with engine in same accident as case II. Was considerably shocked, but soon recovered consciousness, a severe contusion, with deep cut extending from middle of frontal bone over the left eye through the brow and eyelid; contusion of left side of head and jaw, with a severe contusion and deep cut into the bone, just below the tuberosity of the tibia of the right leg; a bruise on the back and left hip,

and several pieces of glass imbedded in the palm and wrist of the left hand. The wound over the eye having been thoroughly cleansed and disinfected with bichloride solution 1-2000, was carefully stitched, and dressed antiseptically with the gauze. The wound of the leg was treated in the same way. Lotions of vinegar and water equal parts, applied over the back and hip, and spirits of turpentine to the wounds caused by the glass. A hypodermic injection of morphia and atropia of ¼ of a grain with the same quantity by mouth, and the patient was left for the night. There was not a particle of pus formed in any of the wounds, and at this date, August 20, the patient is walking about with the aid of a crutch, apparently in perfect health, except a pain in the back and left side, alleged "to come and go" from time to time. How far this pain is assumed, actual, or imaginary, will probably remain an insoluble problem until the amount of compensation is agreed upon.

CASE IV.

Charles Williams, car-coupler, age 26, a powerful man, was caught, October 22, between two cars while attempting to couple them. Was severely mashed or compressed over the thorax and abdominal regions, producing general shock and apparent concussion with loss of consciousuess, for eight or nine hours. The accident happened at 4 o'clock, and he was seen at 4:30 and found in the following condition: Cold; almost pulseless; respiration nine or ten; pupils dilated, with entire relaxation of all the voluntary muscles, but firmness of sphincters existed. The immediate treatment consisted in hypodermic injections of morphia and atropia, followed by hypodermic injections of whisky, as frequently repeated as the system could bear until the patient was removed to his home. After the removal, fomentations of *hot water and flannels* were kept constantly applied over the chest and abdomen for 24 hours as hot as could be borne without the risk of scalding, at the expiration of which time consciousness was restored; but a

decided condition of irritative fever was established, manifested by increased temperature 100; pulse 100; with great intolerance of control and general irritability of temper. This patient continued to improve to this date, November 28, when he was permitted to return to duty at his own request.

Other and more interesting cases might be added to those enumerated, but it is unnecessary for the purpose I have in view, which is to warn the young practitioner "to watch and wait"; because the dangers after injury are:

(1). Continued depression, sinking and death. Only to be recognized in their approaches by careful watching, and only to be met by restoratives or heart supporters, and abstinence from bloodletting and other sedatives during the early period.

(2). Constitutional irritation (fever) and excessive reaction of a sthenic or vascular character to be met by bloodletting, if it needs be, or by cold applications to the head, and spongings of the body, supporting the heart and producing quiet in the meantime with hypodermics of morphia and atropia and copious enemata to act upon the bowels.

(3). Asphyxia or other threatening disaster must be met by care, prudence, discretion and coolness on the part of the surgeon attending, who should never lose sight of the fact, that from first to last, the evacuation of the bladder is of primary importance.

OPERATIVE PROCEDURES IN HYPERTROPHY OF THE PROSTATE.

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Curative measures in hypertrophy of the prostate received but little attention by the older masters of surgery. It was looked upon as a natural sequence of age, and by many regarded as a conservative effort of nature to avoid stillicidium.

Mercier, to whom we are indebted more than to any other surgeon for directing attention to this trouble, commenced his studies of the subject in 1836, and published his *Researches* in 1841. Based upon the fact,—to which he was the first to give prominence,—that a large proportion of cases of obstruction of urine from hypertrophied prostate was due to median enlargement, he instituted his operation of punching an artificial urethra through this median obstruction; but it was not until within the present decade that his labors and operation were generally known. Dr. J. W. S. Gouley, after visiting France, where he met Mercier, introduced his operation into the United States as late as 1878, and he is the only one, so far as I am aware, who has performed it in this country.

These *Researches* of Mercier, and a knowledge of the fact that he had relieved over four hundred cases by his operation,

without serious results, a few fortuitous instances in perineal and suprapubic lithotomy, with accompanying enlarged prostates, in which the median bar had been divided, or intravesical pedunculated outgrowths removed incidentally, opened up to the minds of surgeons hope of relief, even in the advanced stages of hypertrophy of the prostate; and the last decade has witnessed a decided advance in the treatment of this former opprobrium of medical science.

Retention of urine being a prominent feature of hypertrophy of the prostate, it was natural that relief should be sought in the line of retention from strictures of the urethra, which had long been familiar to surgeons. Hence, the first efforts at relief were in *punctures* of the bladder, which had for their object only relief of the retention, and did not aim at permanent relief. These were made (1) by the canula or aspirating needle into the bladder above the pubis, (2) by the rectum, or (3) through the gland itself, and (4) suprapubic incision and puncture.

The first two need only to be mentioned as they aimed only at temporary relief.

Puncture through the gland itself.—Mr. Reginald Harrison, at the British Medical Association, Liverpool, 1883, said:

"I tapped the bladder from the perineum through the enlarged prostate, quite independent of the course of the urethra. A canula was retained in this position for two months, with great comfort to the patient. He was eighty years old, but completely recovered and lived for several years; and in this I include the acquisition of the natural and unaided use of his bladder."—(*Medical Record*, January 21, 1888.)

This is similar to the forced catheterism practised by John Hunter and Sir Everard Home, but "abandoned as uncertain and dangerous."

Mr. Harrison himself, speaking of this method of puncture, before the British Medical Association in August, 1885, says:

"I must admit that, following the practice of Syme and to some extent of Edward Clark, I have decided preference for an incision through the perineum on the twofold ground of safety and comfort."—(*The Medical News*, August 18, 1883.)

Suprapubic incision and puncture.—Sir Henry Thompson, in a communication to the Royal Medical and Surgical Society (*British Medical Journal*, June, 1879), suggested an opening into the bladder by suprapubic incision and puncture. He thus describes the method:

"A curved hollow sound being introduced into the bladder, the point was made to project against the wall of the organ just behind the symphysis. A small incision being then made, the end of the staff was sought with the finger and the bladder carefully punctured; care being taken not to make the incision too large so as to avoid the escape of urine by the side of the tube to be introduced. A gum-elastic tube, having a shield like that of a tracheotomy tube, was then passed into the end of the sound, and thus introduced into the bladder."

Mr. Harrison, in speaking of the different methods of puncture of the bladder for the relief of retention, in the Lettsomian Lectures, before the Medical Society of London, January, 1888, says:

"Excellent in design as these proceedings are, they appear to me to fall short in an important respect—in not dealing with the cause of the obstruction. Two of these measures (suprapubic and per rectum) are open to objection on the ground that these artificial canals are inconveniently placed as permanent vents, for it would seem desirable that the urethra should, as far as possible, be utilized, and the external opening for the escape of the urine be dependent."—(*Medical Record*, January 11, 1888.)

But none of these methods of puncture are now in favor. The surgery of the present day demands more permanent relief by removal of the cause.

The Mercier operation.—The pioneer in the more radical processes was Mercier, of Paris. He was the first to recognize fully the important fact that a large proportion of cases of obstruction to the passage of the urine in these cases was due to an obstructing bar or enlargement of the median portion near the neck of the bladder, often without any serious enlargement of the lateral lobes. With this fact in view, he devised his operation of punching through this obstructing bar a channel, or artificial urethra. The operation was performed by an instrument resembling a *fenestrated lithotrite.* The beaks of the blade were shorter, and the curve more abrupt, as in the Mercier curve of the Benas gum catheter. The edges of the male blade were smooth instead of striated, as in the lithotrite, so that in passing through the fenestrum of the female blade it made a clean-cut channel through the obstructing bar, which was held between the beaks. "The operation, despite the fact," as we are informed by Dr. Gouley (*Lancet*, July 17, 1880), "that its originator had performed it upward of four hundred times with excellent success, and without the occurrence of abundant, much less fatal, hemorrhage, has not been looked upon with confidence." This, no doubt, arises from the difficulty of nice differentiation in the character of cases, and the conservative spirit of the past, which tends to delay operative interference in these cases as long as possible. The operation is suited only to those cases (for which it was designed by its inventor) in which the obstruction is from a bar or band at the neck of the bladder, and "should be limited in these," says Dr. Gouley (*Amer. Surg. Assoc.*, 1885), "to cases in which the obstructing bar is not exceeding one-half or three-quarters of an inch in thickness."

Dr. Gouley has somewhat modified Mercier's instrument. In an article read before the Surgical Association, 1885, he thus describes his modification:

"On account of the difficulty which I have experienced with Mercier's prostatectome in surmounting from behind

forward the urethro-vesical obstruction with the male blade, I devised a prostatectome, of which the following is a brief description: The instrument resembles an ordinary modern lithotrite. It consists of a male and female blade, the one sliding into the other. The male blade is hollow, its sides are vertical, and its superior portion a little rounded. It is welded to a tubular shaft, in the center of which is a long needle worked by a button at the proximal extremity of the handle. The object of the needle is to transfix the prostatic vulvule or tumor, and hold it in position from the moment it is seized till it is cut and extracted. The beak is hollow to receive the piece of valvule."—*Gaillard's Journal*, July, 1885.

The principal advantage this instrument has over that of Mercier's is in the angle of the beak with the blades. In Gouley's instrument it is less abrupt (Mercier's being almost rectangular), and thus passes over the obstructions with greater ease. It is also lighter, and the needle adds an additional safety in retaining and extracting the incised portion of the obstruction.

Bottini's operation.—Closely allied to Mercier's method of punching an artificial urethra is the method of Bottini, of Pavia, which he states he has followed for ten years (*Medical News*, February 11, 1888). He formed an artificial urethra by means of galvano-cautery. The operation has been termed thermo-galvanic prostatectomy. It consisted in producing an artificial urethra by means of galvanic cautery instead of the punching process of Mercier.

In one of the cases reported, a man of sixty-eight years was restored to complete health, with full functions of the bladder, in three months. In another—Dr. Musatti—the catheter was withdrawn on the fifth day, and the patient left his bed two days later. The result was great improvement in health, and micturition every five or six hours. Dr. Musatti declares the operation less painful than cauterization of the prostatic urethra with nitrate of silver. This may be used not only for the removal of the obstructing bar at the

neck of the bladder, but also where the obstruction is from the enlarged lateral lobes. This gives it a wider range of application than the Mercier process, While it has features which recommend it in certain cases, it is not without danger, and has not been used in a sufficient number of cases to warrant its general introduction. It is better thought of in Italy and Germany, where it has been more often used than in this country.

Newman's method.—Dr. Robert Newman, of New York, claims to have used electrolysis, or thermo-galvanic absorption, with a good degree of success. The instrument consists of a smooth sound with a fenestrum at its lower extremity. At the opening is a piece of platinum wire, in connection with a galvanic battery. The current is kept up only for a few seconds, and repeated at intervals of three to five days. This does not destroy the tissue, as in the process of Bottini, but only promotes absorption of the enlarged gland. It is devoid of danger, and may be used even in the earlier stages of the disease. The principle here is somewhat different from electrolysis in strictures. The absorbent action is brought to bear upon glandular instead of cicatricial tissue, and we may reasonably expect a better result than in strictures.

I may here refer to one other method of the use of galvanism. In my paper before the Alabama Surgieal and Gynecological Society, last year, I said:

"Electrolysis by puncturing the gland itself by a suitable galvanic needle has not, so far as I am aware, been tried; but from the well-attested success of this method in other tumors, it would seem worthy of the attention of some bold innovator."

This method has been since then tried by Casper, of Berlin. At a recent meeting of the Berlin Medical Society he reported four cases treated in this manner. The needle was inserted in three points in the gland *per rectum*, and a current of from twelve to fifteen milliampères used for fifteen minutes, the needle being carefully insulated to prevent injury to the other

parts. Two were much improved; in one the result was negative, and in the other there was injury from defective insulation of the needle.—(*The Medical News*, June 16, 1888.)

Perineal prostatotomy and prostatectomy.—Sir Henry Thompson had practised digital explorations of the bladder through perineal incisions for the removal of tumors of the bladder. This naturally led to perineal prostatotomy and prostatectomy, as by this route either the obstructing bar at the neck of the bladder could be incised, or the intravesical pedunculated outgrowth could be reached and removed with the scissors or the snare.

This was an advance upon the Mercier and Bottini operations, as it enabled the operator, by digital exploration, to make a more certain differentiation of the case; and at the same time relieve by free drainage the cystitis, which is an almost constant accompaniment of these cases.

Dr. Gouley seems to have been the first to recommend this method. In his *Diseases of the Urinary Organs* (1873), after describing the method of perineal incision for the relief of retention, under the head of "Ablation of Median Prostatic Outgrowths," he says:

"The surgeon should then endeavor to give permanent relief by a procedure which will probably not add greatly to the dangers of the preceding step. He should first explore the prostate through the artificial opening, and if he discover a median outgrowth, or isolated tumor, he should dilate the prostatic sinus or incise the prostate laterally, and enucleate the tumors, or if there be a median outgrowth excise it; but the better plan is to remove it by means of a small wire *écraseur.*"

Dr. Lardiner, of Leipsic, was led by an accidental seizure and removal of a pedunculated middle lobe in operating for stone, to this same method.

"At first the author was vexed with the unintentional interference with the prostate, but when he saw that good effects followed he was led to believe this was the proper

treatment of this class of hypertrophied prostates. He afterward repeated the process, confining himself to the forceps in removing the pedunculated enlargements."—(*Annals of Surgery*, 1887, p. 433).

Reginald Harrison frequently used this method of perineal prostatotomy and prostatectomy, and preferred it to all others. He says:

"So far I have been able to do all I desired in the way of removing more or less of the obstructing prostate by proceeding from the perineum."—(*Med. Record*, January, 1888.)

Prostatectomy from the perineum has this advantage: It permits a direct digital exploration of the parts, and thus we are enabled to judge definitely whether the obstruction is from a band or bar at the neck of the bladder, an intra-vesical pedunculated outgrowth, or a general enlargement of the gland; and we may incise the first with the bistoury (Thompson and Harrison); the second may be seized with the forceps (Lardiner), or removed with the scissors (Harrison and Thompson), or seized with the galvano-snare (Gouley and Lang); and the third incised with the bistoury, and a drainage tube inserted (Gouley and Harrison.)

Suprapubic prostatectomy.—The revival of suprapubic lithotomy, and the safety with which the bladder can be opened by suprapubic incision, suggested this as another method of relief in prostatic troubles. The operation consists in opening the bladder above the pubes in the usual manner and severing by snare, the scissors or the forceps that part of the enlarged prostate which prevents the outflow of the urine. Dr. McGill has practised this method in three cases with the best result (*The Med. News*, December 10, 1887). In the *Med. Record*, September 23, 1888, there is a report of two cases treated by suprapubic incision, in which Dr. Atkinson removed the protruding enlargement by enucleation, after incision of the mucous membrane, having first removed a small pedunculated growth with the scissors.

Dr. Hunter McGuire, at the Congress of American Physicians and Surgeons (Washington, September, 1888), spoke of suprapubic cystotomy for the purpose of removing intravesical outgrowths of the prostate, and described his method of leaving a permanent fistulous opening above the pubis as a means of keeping the bladder thoroughly emptied. In the case referred to, the patient was not only relieved of the troublesome cystitis, but acquired voluntary control of retention and expulsion of his urine.

Thus it is seen we have a variety of methods for relief. Each of them may have advantages, under certain conditions peculiar to itself, and by a careful differentiation of cases, and a prudent selection of the method suited to each case, we may hope to give relief, more or less permanent, in many cases heretofore abandoned as without hope.

What is now needed is an accurate differentiation of cases, a prudent selection of the process suited to each case, and judicious determination of *the time* when it may be proper to interfere by operative procedures.

Much has already been done in the line of differentiation. Mercier, to whom too much credit cannot be given, made a long stride in the right direction when he emphasized the fact, that to median obstruction, frequently without any serious enlargement of the lateral lobes was due a large proportion of cases of obstructed urine; and his operation was wisely conceived for relief of this condition. He not only emphasized the existence of median obstruction, but by means of his rectangular, short-headed catheters and sounds, did much in determining the situation, form and size of other obstructions, thus paving the way to a more accurate differentiation of cases.

The varieties may be thus classified:

(1) *General enlargement:*
- (*a*) Of one lateral lobe.
- (*b*) Of both lateral lobes.

(2) *Median obstruction:*
(*a*) Sessile tumors.
(*b*) Bar, or valvule at neck of bladder.

(3) *Intravesical ontgrowths:*
(*a*) Pedunculated outgrowths of median portion.
(*b*) Prolongation of lateral lobes.

These varieties may occur separate and distinct, or they may be combined one with the other. General enlargement, while it may be the prominent characteristic, may be (and frequently is) accompanied by median obstructions—extra- or intravesical—or it may occur without these median complications; while, upon the other hand, the median enlargement may be the main or sole trouble.

In the extra-vesical median, sessile enlargement, the submucous tumor is at some little distance from the urethro-vesical orifice and raises the connecting tissue (*commissurè*) of the lateral lobes more obtusely, while in the bar, or valvule, the tumor being located nearer the vesico-urethral os, and from the absence of resistance, raises the mucous fold more acutely and near the neck of the bladder.

The intra-vesical varieties may be a prolongation of the lateral lobes, one or both, into the bladder; or the median portion may protrude into the viscus, as a pedunculated tumor.

For a wise application of the different methods of operaation, we should, as near as possible, differentiate between these varieties, so as to select the operation suited to each variety.

(1) We may infer something from the clinical history of the case. If the patient is young (from 54 to 60) with decided obstruction, and no amount of effort will relieve the bladder, we would infer a median enlargement, with valvule at neck of bladder or a pedunculated intra-vesical outgrowth. If the obstruction has been very gradual in its approach, and the patient is still able at advanced age (seventy or more) to

empty the bladder after patient effort, we may infer that the enlargement is general. This inference is the more certain if the patient has a stillicidium, or kind of syphonage of the urine, when the bladder becomes distended. This stillicidium is often present when the bladder is over-distended, and the fact of retention is overlooked.

(2) But our main reliance is upon physical examination. This is made per rectum or by the urethra. By careful digital examination, per rectum, we may determine the size, hardness or softness—smoothness or roughness—whether one or both lobes are enlarged, whether the enlargement is general, or whether there is an absence of general enlargement, and hence the inference that the obstruction is median or an intra-vesical outgrowth. If now with the sound or catheter (soft-gum catheter of Benas, with Mercier curve, preferred) we find the constriction commences at the apex of the gland, and continues evenly until it enters the bladder; and if in *withdrawing* the catheter we find the *grasping* of the catheter continues steadily until it passes the apex, which it does with a kind of jump, we have full confirmation of the diagnosis of longitudinal or general enlargement.

But, in a general enlargement, there may be complications In addition to the general enlargement we may have a sessile tumor, valvule, or intra-vesical pedunculated outgrowths, or extensions of the lateral lobes into the bladder. The sessile median enlargement combined with lateral general enlargement, may be detected by the increased resistance to the passage of the catheter or sound as we reach the portion of the urethra just before entering the bladder. This may be noticed either in introducing or withdrawing the catheter. The pedunculated intra-vesical outgrowths, and intra-vesical prolongation of the lateral lobes whether existing with or without general enlargement, are to be determined by the Mercier rectangular sound, or by Dr. Gouley's cysto-pylometer. This instrument, which is a modification of Mercier's sound, is thus described by Dr. Gouley:

"The beak of the instrument is nearly rectangular and one inch in length. The shaft is in two longitudinal segments—the male segment sliding over the female and being flat at its vesical end to come in contact with the corresponding flat surface on the inner side of the beak of the female segment, and designed to grasp the valvule or bar."

The instrument when closed resembles a metallic sound with a short, rectangular curve. It is introduced closed and when in the bladder the beak is turned gently from right to left and the reverse—noting carefully any resistance it may encounter. If it meets with firm, unyielding resistance on either side, we may infer intra-vesical enlargement of the lateral lobes; but if the resistance is yielding, and changes its relations to the handle of the instrument, we may infer that we have a pedunculated intra-vesical median outgrowth.

We may with a good degree of certainty distinguish between the sessile median enlargement and the crescentic valvule or bar, with the same instrument. The cysto-pylometer being introduced closed, into the bladder, and drawn outward until the beak rests against the intra-vesical orifice of the urethra, the male blade is carefully withdrawn. The amount of resistance by the median enlargement is estimated fairly well by the resistance met with in withdrawing this blade. After the resistance ceases, the male blade is gently carried toward the bladder again. If it is a sessile median enlargement, the blade will, with a continuous resistance, pass into the bladder; but on the other hand, if it is a valvular bar, the beak will be arrested by it, and the obstruction may be grasped between the beaks of the male and female blades, and its thickness estimated by the amount of separation of the blades, by the scale on the handle of the cysto-pylometer.

Electro-cystoscopic explorations, where the urethra will admit of the introduction of the instrument, may also be brought to our aid, and we may be able with this instrument to differentiate intra-vesical outgrowths of the prostate from intra-mural vesical tumors.

Thus, by inquiry into the clinical history of the case, careful digital examination per rectum, exploration of the urethra and bladder by the catheter and the cysto-pylometer, we may gain a fair idea of the character and position of the obstruction. This being determined, we may then select the surgical process suited to the case.

If the obstruction is from a general enlargement of the gland, we may use the Bottini galvano-cautery; or galvano-absorption, as practised by Dr. Robert Newman; or perineal prostatotomy. If, upon the other hand, the examination shows a general enlargement, with intra-vesical outgrowths, we may resort to suprapubic prostatectomy combined with urethral prostatotomy by means of an instrument similar to the urethrotomes used in dividing strictures of the urethra; or perineal prostatotomy as practised by Mr. Harrison. Or in these complicated cases, we may use the method of McGuire, and instead of combining perineal or urethral prostatotomy with supra-pubic prostatectomy, be content with a supra-pubic fistula for the exit of the urine.

But if we determine that we have a median valvule or bar as the obstructing cause, the Mercier operation is plainly indicated. Or if the case is one of intra-vesical outgrowth with but little general enlargement, the suprapubic operation is the method indicated.

Another factor of success in these cases, is the *time* at which surgical interference should be resorted to. The remark of Mr. Harrison, "that no operation should be thought of so long as the catheter can be introduced," should be modified. When we have at our command methods that may be used with safety in the earlier stages, when the cases are carefully differentiated, and relieve the patient of years of annoyance or suffering, I can see no good reason why we should not use them. And probably in this *timely interference* is where we may expect most in the relief of prostatic troubles. The conservative spirit which has guided our actions to the present, may be in danger of going too far, and leaving undone what might be well done. The early use

of the process of Mercier, and the milder one of Newman, are well worthy of consideration upon properly selected cases, and the future will doubtless see them often resorted to before patients are worn out by long suffering, and reduced to the last extremity, when the system is badly prepared for any operation.

The operation of Bottini, too, with well-constructed instruments, would seem to be preferable to a life-long suffering or premature death. This operation, which has not been well received in this country, is better thought of in Italy and Germany. Nussbaum, while condemning almost all other forms of surgical relief, approves the galvano-caustic method of Bottini.

Even perineal and supra-public prostatectomy, in this day of improved surgical technique and antisepsis, may well be resorted to in the earlier periods, rather than an apathetic contemplation of a life of suffering, and the gradual and sure approach of a condition in which, *as a last resort*, these measures are attempted with but little hope of success.

ANTISEPTIC SURGERY IN COUNTRY PRACTICE.

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In medio tutissimus ibis.

One of the characteristics and distinctive features of this Association, I presume, will be the large element of country practitioners of surgery and gynecology who will constitute its membership. Doubtless a very large proportion of the reports that will be read at the annual meetings, will represent the practice done in the comparatively small towns and villages and on the plantations and farms in the Southern States. Very few large hospitals, or other eleemosynary institutions will be represented in it. Consequently, those subjects and those methods which more peculiarly interest and pertain to that class of practitioners, should be selected for especial consideration in our deliberations. Simplicity of details, and economy both in time and in money are matters of the greatest importance to them. Many of them ride by day and by night on horseback, in buggies, and on railroad trains, in all seasons, over the hills, and through the swamps, carrying in a pair of saddlebags, or a little hand-bag, all the medicines, instruments and appliances used by them in the treatment of all diseases and injuries, medical, surgical and

obstetrical. They often visit a considerable number of patients on the same day requiring diverse treatment, some of them many miles apart. In many instances they have to contend single-handed against poverty, ignorance and filth, separately or combined. Under such circumstances they can afford neither time nor money for non-essentials, either in theory or in practice. They soon become self-reliant, and learn to discard everything superfluous or unnecessary. No class of practitioners is less restrained by the formalities and the prescriptions of authority than they. Being more interested in the utilitarian than the speculative theories of the profession, they are sometimes in advance of their more fortunate (?) city brethren on practical questions, even though they should not be *au fait* in the latest sensation.

If half of what has been said and written in behalf of antiseptic surgery were true, it is doubtful whether the country practitioner should feel more grateful for it as a great discovery, or more discouraged by the extravagant and impracticable conditions which it imposes. Although these conditions have been greatly simplified of late, and much of its complexity has been abandoned, still all the details now required are practicable only in hospitals and in the homes of the more wealthy classes.

Consequently, if country practitioners should encumber themselves with all the paraphernalia required, the environment of their patients in a large proportion of cases would render it useless. Admitting then that the doctrine is true as claimed, the strict rules of antiseptic practice can be followed by country practitioners only in a limited number of cases, as the subject is now understood.

I am not vain enough to undertake a thorough critical review of antiseptic surgery. A subject which has occupied so much space in all our medical journals so many years, must be sufficiently familiar to every physician in the country. And having no new facts to present, it would be a waste of time to reiterate that which is already known to everybody, even if I were competent to do so, which is by

no means the case. But a few practical reflections on some of its more salient points may be allowable.

Inasmuch as great latitude has been taken in the consideration of antisepticism, which includes all that is meant by antiseptic surgery, it may be well to define what is meant by the term as used in this paper.

According to some it is used to include not only all means used to destroy germs *in esse*, and to prevent their generation, but also to prevent infection from any and every other source. Perhaps but little fault can be found philologically with this definition. But practically it is not correct, and I would restrict it to a consideration of the means and methods proposed for the destruction and prevention of micro-organisms of all kinds, on the assumption that they are the specific causes, the actual and active, and only pathogenetic agents in the several diseases in which they are found. The use of the term, as applied to means to prevent sepsis from any other source is an aftert-hought; is not the construction intended by its originators. The term "phrenology" would imply, from its etymological construction, mental philosophy, or the science of the mind in its broadest sense; but we all understand by that term, as it is commonly used, what has been vulgarly called "bumpology," or the art of telling the peculiarities of individuals by palpation of the head, or, if you please, cerebral localization. In a single word, then, I would define antisepticism, as applied to antiseptic surgery by modern writers and practitioners, as *bacteriopathy*.

As all know it is founded on the germ theory of disease, one of the most beautiful and plausible theories that was ever launched on the sea of medical philosophy. But it is another striking example of the tendency in our profession to seek for a principle before the facts upon which it is founded have been sufficiently investigated and established. Indeed the medical profession has been dominated from time to time all through its history by theories which have received more or less general endorsement, some of which when subjected to the critical tests of time and experience

have been rejected as false *in toto*, while many of them, though containing many false facts, have developed some important scientific truths, and have contributed some real and useful precepts to the practice.

Cullen said "there are more false facts than false theories in medicine." But when we retrospect its history from the earliest days to the present time, we find much that is false in theory and in fact. Current medical literature has always abounded in chaff, from which it is often difficult, for the time being, to separate the grain. Leaving out the vagaries of homeopathy, allopathy, hydropathy, Thompsonianism, eclecticism, *et id genus omne*, we need only refer to the doctrines of the various schools from Pythagoras to the present time, and to the transient systems of practice based on them, which have held sway for a short season. They are too numerous and varied to even enumerate, but everybody can readily recall many examples.

Medicine has been cursed in all ages by so-called discoveries, and many of the greatest minds in the profession, in every age, have been wasted in the vain pursuit and defense of some imaginary discovery. Paracelsus, a noted teacher of medicine in the sixteenth century, discovered the doctrine of Tartar, which he said was the cause of all diseases of accumulation, obstruction, and concretion. Thompson discovered that all diseases originated from cold, and that heat and heating remedies supply a perfect panacea. Hahnemann, the founder of homeopathy, discovered that all the maladies which afflict mankind—epidemic, sporadic, idiopathic, and symptomatic—spring from three original diseases, viz., syphilis, sycosis, and the itch. His *similia similibus*, dilute potencies, and infinitesimal doses are therapeutic novelties worthy of his pathology. And now comes along the doctrine of the germ theory, which teaches that all diseases originate from specific germs, or living organisms. We have the bacterium of suppuration, the bacillus of tuberculosis, the bacillus of syphilis, of hydrophobia, of cholera, of tentanus, the gonococcus of gonorrhœa, etc.

This beautiful theory supplies a desideratum in etiology long felt, and furnishes an easy solution to many problems which have greatly perplexed the profession for many generations. Immediately after its promulgation, the fertile mind of the discoverer, ever on the alert for something new, was set to work to find some means of killing these microbes, which like the giants that peopled Don Quixote's brain, cause all the miseries and all the woes that afflict mankind. Antiseptic surgery, Minerva-like, sprang into existence, in full panoply, and has carried the medical profession by storm with all its boasted modern advancements. So strongly is it endorsed, that it is almost as much as any ordinary man's professional scalp is worth to express any doubts of its entire correctness. Carbolic acid long stood at the head of the list of germicides. Not only the hands and instruments of the surgeon, but all dressings were required to be constantly wet with a solution of it, and the very atmosphere of the operating room must be filled with its fumes. A complicated apparatus was required to generate the spray, which however proved to be so unhandy and so inconvenient that it was found to be unnecessary, and has been abandoned by many operators. To say the least of it, it is possible that more lives have been lost by it, than by the microbes it was intended to kill. Without attempting to enumerate all or any of the minor agents recommended and used as germicides, I will only mention the latest—bichloride of mercury. This is all the fashion now, having supplanted carbolic acid to a very great extent. It is a most virulent poison, and to be at all safe, it must be diluted to homeopathic proportions. Even then, if strong enough to be relied on as a germicide, it is not devoid of danger. Billroth says: "Corrosive sublimate in dilute solution is practically inert as an antiseptic application to wounds, and renders the patient and surgeon alike liable to mercurial poisoning. Carbolic acid, known to be dangerous in strong solution, is in very weak ones, as good irrigation for wounds as clear water, but probably no better."

We are not yet freed from the superstition and credulity which have always prevailed in our profession. We are still

liable to be captivated and led astray by the plausible deductions, and legitimate conclusions drawn from false premises by enthusiastic discoverers. And if we look with contempt and pity on the absurdities of the exploded doctrines of our predecessors, we doubtless shall meet the same fate from our successors.

It yet remains to be proved that the discovery of bacteriopathy is any more true or practically useful than homeopathy, or hydropathy. False and absurd as these latter may be in theory, and in fact, nobody will deny that they have accomplished good results in practice. And if antisepticism in surgery should accomplish nothing more than to demonstrate the great advantages of absolute cleanliness, it will have accomplished incalculable good. It will not be the first instance in which exhaustive studies and experiments have been made in pursuit of a false theory, whereby grand results, not contemplated and not anticipated have been accomplished. Astrology diligently studied for many centuries, for the purpose of learning how to foretell, and even to control future events, led to the grand and beautiful results of astronomy; and alchemy, which engaged the minds, and the life-time studies of the greatest philosophers of the world, whose object was to find out the secret of converting the baser metals into gold and silver, and to discover the elixir of life, or the art of preserving human life indefinitely, resulted in the splendid achievements of modern chemistry. I would not therefore, underrate the labors and investigations of such men as Pasteur, Koch, Klebs, Cohn, Cohnheim, Virchow, Tyndall, and others in Europe and America engaged in similar studies. I confidently expect important results from their labors, whether the germ theory be established or not. But any system of practice founded on a theory not yet proved to be true is premature, and is destined to be severely pruned, if not entirely discarded by the inexorable hand of time. Whatever of truth there may be in it, of course, will stand the tests of time, but the errors will be relegated to the limbo of their predecessors.

The frequent presence of bacteria, or other micro-organisms in disease-processes is generally admitted and seems to be easily demonstrated. But their functions, or their relations to those processes as cause or effect, are not established and do not seem likely to be soon. Opposed to the theory of their agency as etiological factors, we have the hypothetical doctrine of their incidental or accidental presence as natural scavengers for the consumption of effete matter. The extreme minuteness of these bodies, requiring the most powerful microscopes for their investigation, as well as the great liability to optical illusions, makes it so difficult to understand their true relation to their surroundings, and to define their exact agency in disease, that we should be very slow to found upon their presence any theory or any system of practice, calculated to revolutionize the established methods of many centuries.

Bacteria or micrococci have been found in great quantities on the mucous membranes, in the blood and in the fecal discharges of healthy persons. They have been found under Lister's antiseptic dressings without suppuration following. It is asserted, furthermore, by high authority, that suppuration can be produced without the presence of minute organisms of any kind. The bacillus of tuberculosis, from the discovery of which we were induced to hope so much, has been found under such varying circumstances, that nothing practical seems likely to result from it. The same may be said of all the rest, except perhaps the bacillus of anthrax, which alone seems to have met all the requirements of mycologists, as a specific and demonstrable cause of disease. In the case of all the others the conclusion is merely from analogy. It is claimed that a septic liquid may retain its poisonous qualities after all microbes have been destroyed in it. And it seems to be proved by experiments that septic poisoning can be produced in animals by the products of organic decomposition without the presence of living organisms. It is claimed that bacteria becomes most numerous in materials of a septic or infectious character after the period of their toxic intensity

has passed by. Wherefore it may be assumed, with equal authority, that all the effects usually attributed to disease germs may be caused by the toxic action of the soil in which they have existed, whether it be membrane, urine, blood, virus, artificial culture material, or anything else.

In this connection the pathogenetic agency of ptomaines and leucomaines should be duly considered. But I do not propose to consume any time with that subject, although it is now engaging in its investigation, some of the ablest chemists and biologists in the world. If the researches of Gautier, of Brieger and others engaged in its study, should verify its etiological importance, and if the claims of bacteriologists should be established, our profession will be completely revolutionized, and all our present systems of etiology, pathology, and therapeutics will be supplanted. But however much we may boast of our superior attainments and enlightenment, it is not at all probable that we are so far superior to our ancestors as to warrant any such expectations. It is a fact, I believe, that every generation has considered itself much smarter than its predecessors, but yet we find "that history merely repeats itself."

But I have already extended the limits and scope of this paper beyond what was intended when I commenced writing, and I will conclude with a few practical suggestions for the benefit of my country brethren. It is a fact undenied, and probably undeniable, that the mortality from wounds and surgical operations, especially in hospital practice, has been greatly reduced since the introduction of antisepticism. But it is a significant fact, that the very highest degree of success has been achieved by surgeons who do not use the antiseptic methods. And this is not due to accidental or fortuitous circumstances. Surgeons of equal qualifications have operated at the same time, in the same hospitals, one with and the other without all the rules of antisepticism with equal success. I venture the assertion, that the qualified general or country practitioner, who uses no antiseptic *per se*, can boast a degeee of success equal to that of the most distinguished

specialist with all the antiseptic appliances most rigidly enforced. I will not consume time in an attempt to enumerate the causes of this, or the causes of the great decrease in mortality, not the least of which, is the increased importance attached to cleanliness, and to minute details in operations, and in treatment. Ever since the Mosaic laws were promulgated, filth as a factor in disease has been more or less appreciated in all civilized countries. But never has this appreciation taken such practical shape as it has done within the last few years. The fact is established and admitted by everybody, but like many other facts in medicine, it is empirical, its *modus operandi* is not as yet understood. Great harm has been done to the profession by the crude philosophy and hasty conclusions of pseudo-scientists, which constitute the great bulk of our literature on this subject. It matters not how distinguished the writers may be, and it matters not how plausible their reasons may be; if it is not based on original research, and on premises well established, their conclusions are not reliable. They may be familiar with the microscope, and they may be able to focus micro-organisms, and yet not be reliable. Very few men in the world are qualified to give authoritative opinions on this subject, and such men are about the last to promulgate a dogmatic declation on this, or any other subject. No amount of study and speculation on other men's labors can settle any question until all the basic facts have been clearly evolved and established. I would therefore caution my country brethren and all general practitioners, who are practical, if anything, to beware of hasty and imperfect conclusions. Wait until all doubts and uncertainties have been removed by those who alone can do it. Avoid the growing spirit of reckless experimentation. In the meantime, let us stick to those means and methods, which have given success to our fathers, and which have enabled us to achieve results, which we can compare with pride and confidence with the best of them. I would not reject anything because it is new, but I would not adopt it merely because it is plausible.

DERMOID CYSTS OF THE COCCYGEAL REGION.

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Pathological histotology offers us nothing wholly satisfactory in regard to tumors. What is held respecting their etiology is not based upon exact histological knowledge, but is mainly hypothetical.

There are those who consider tumors as tissue overgrowth, and define their development as due to causes and conditions which ordinarily determine hyperplastic growth. In many instances it can be demonstrated that such conclusions are incorrect, for in such tumor growth can be shown, by microscopic evidence, to be of a different nature from the structures from which they spring, or originate. It may be truly said, that a tumor or neoplasm nearly always differs in construction from the tissue out of which it grows.

Another class of etiologists have inferred that tumors are formations resulting from inflammatory changes. It can be shown, however, that the entire evolution of neoplastic histogenesis is widely at variance with the formative processes that originate in inflammation. We may thus also exclude traumatism from the genesis of tumors. Experience sustains the conclusion, and when it so happens that a tumor appears to develop from traumatism or inflamed tissue, such a result is so rare that it may be considered coincidental, and does not prove that such injury or inflammation sufficed to induce

the tumor in tissue primarily normal. Other factors are needed before we can claim that the genesis of tumors is due to traumatic or inflammatory causes alone.

Again it has been suggested to look to the embryo for the factors of tumor production. When we consider that tumors occur at all ages of life—in the new-born babe and in the centenarian—and in tissues without the suspicion of abnormality attaching to them, some other explanation will be pertinent before the embryonic theory can take a strong hold upon the profession.

The beautiful hypothesis of Cohnheim bolsters the embryonic theory, and presents the subject for adoption *versus* Virchow's ideas, to which I have already alluded. He refers the actual evolution of tumors to factors generated during the embryonic period, but considers development after extra-uterine life has occurred, and progressed to any age, due to the continuance of germinal embryonic cells in the otherwise mature organism. The tumor takes its origin from a delayed, lingering cell, which escapes utilization in the normal development of tissue and remains unutilized until some external condition supplies the impetus that induces cell multiplication, which results in tumor production. He thinks the tumor germs, consisting of embryonic cells, may be small and elude recognition; be quite unrecognizable among the ordinary anatomical elements of the tissues of the body in which the tumor developed. His definition of a tumor, then, is: "An atypical new formation starting in a latent embryonic rudiment."

Much that we know of tumors can be harmonized with the Cohnheim theory, or hypothesis. Tumors having structures much alike, and the earlier forming stages of certain tissues, lend weight to Cohnheim's views. We know that there is a class of tumors which date their origin from the embryonic stage, and such is perhaps the nature of the teratomata or congenital tumors, to which, as a special class, the dermoid tumor belongs.

Cohnheim's arguments in sustaining his views are partly predicated upon the observations that many tumors are hereditary, that many are discovered at birth, or develop in early infancy; that a preference is manifested by tumors for sites, where in the earlier developmental stages some complication of structure occurred, such as places where diverse epithelial formations pass into each other (as lips, stomach, cervix, uteri, etc.), or for parts where the evolving process is complex (genital apparatus). In fine, that the genital atypical nature of tumors is in favor of the probable correctness of his views. Some will concede that these arguments speak strongly for his theory, and will at least admit the probability of its proper adaptability to certain classes of neoplasms, but that it is not applicable to all tumors.

The theory that tumors have an inflammatory or traumatic origin is held by many, and numbers among its advocates some of the more advanced etiologists of the present age. We conclude, however, in reviewing these and other hypotheses, that the future will perhaps develop other ideas that shall present such facts, based upon more mature observation, as will harmonize professional thought in regard to the interesting and important subject of tumor genesis.

The dermoid cysts or tumors, which have been claimed as a special class of teratomata, have many peculiarities in common with the normal skin of the body, but occur in positions where skin formations do not normally belong.

These tumors are of interest to the surgeon as well as the gynecologist. The latter may encounter them in connection with the female organs of reproduction. When combined with the ovary, if very small, they may be distinguished by their contents and by the fact that their walls are thicker, whiter and firmer than such envelopes of the Graafian follicles. The larger varieties of these cysts, in this location, have a firm, fibrous envelope, and the microscope will reveal corium and epidermis, hair follicles, sebaceous and sudoriferous glands; now and then adipose tissue, teeth, bone and cartilage are found.

Both young and old are subject to these tumors; but they are more common to the former class. They may develop slowly or rapidly, or may remain dormant indefinitely. I think development is more rapid in the young, as a rule. In five recently observed examples situated at or near the coccygeal region, development began synchronously with the appearance of the beard and pubic hair—all occurred in male subjects. Do not these growths near the mesial line of the body indicate that such formations are derived from the same rudimentary elements as the skin? Is their evolution dependent upon aberrant germinal cutaneous cells from the epiblast, which have wandered to an abnormal site and then, at a later period, when activity is given, by natural causes, to skin function or its hair genesis, have begun to develop after their kind? Perhaps, more probable and pertinent to the coccygeal dermoid, which we may consider an external dermoid, is the hypothesis: That no epiblastic germinal aberration occurs, but that the epiblastic cells are turned inwards during fœtal development, and later on, when extra-uterine life has arrived, and certain stages of physical maturation are completed, through the law of tissue evolution, these laws spring the activities that develop the tumors, only abnormal because of unnatural position. The same view, I think, will hold in regard to other dermoids than the coccygeal, which may be classed external also, such as those occurring at the extremity of the eye-brows, those intimately connected with branchial cysts, etc.

The cysts of the coccygeal region vary somewhat, histologically, from those encountered in the ovarian region. Such has been my personal experience. Hair, sebaceous matter, epithelium, fibrous and granulomatous tissue have been found; but neither bone nor teeth, except in the true teratomata.

The observation of five cases of coccygeal dermoid cysts (so called from location) induce me to present the following inferences:

If a person who is to become the subject of dermoid cyst after passing the age of puberty, be examined, there will in

all likelihood (not invariably) be found a depression or dimple at or near the sacro-coccygeal region. This dimple, or depression, may be shallow, and the inturning of epiblastic cells so insignificant that, at some subsequent period, when life's activities are exaggerated by advancing age, only the development of sebaceous glands will occur, and only the result of an aggregation of sebaceous material will be found—no hair, because no hair follicles are present. Such cases present us with an imperfect development of a dermal cyst and a more perfect formation of the mesial unition that belongs to the embryonic age.

While doing an operation a few days ago upon an aged subject for fistula in ano, I observed a pit or depression as described above. This depression was filled with hardened sebaceous matter, but the inturning of the skin elements was incomplete, and only the *quasi* or partial dermic cyst existed.

I have under observation at this time a lad thirteen years of age, whose mother I attended at his birth, and upon whom I discovered the dimple or depression I have described. When the age of puberty shall arrive with this boy, and skin function is energized into activity and follicles and glands shall assert increased function, I confidently expect a greater or lesser development of such tumor as I here present for your consideration. I often think of the now happy boy, ignorant of what is in store for him when he nears manhood, thinking perhaps he will go from "pillar to post," from doctor to doctor, as I have seen in such cases, one diagnosing an immature abscess, another, caries or necrosis of sacrum or coccyx. At last an incision reveals the nature of his trouble when he has had the mental and physical torture that attaches to physical infirmity, until he reaches the age of twenty-one to twenty-eight years. This is no overdrawn picture. In more than one instance I have heard the story here indicated.

In the cases which came under my observation, when the subjects were twenty-one to twenty-eight years old, I saw this pit or depression; obliquely away from the pit or mesial line, several times extending down to the gluteal region, I

saw the elevated contour of the tumor. Once or twice, extending nearly to the external edges of the sphincter muscle, I saw the same semi-fluctuant elevation that marked the dermoid tumor. These came under notice when the products of the functional activities of the skin had accumulated at the points of abnormal deviation, which began at puberty, perhaps not noticed until several years thereafter. Seemingly an irritation was consequent upon the accumulation. In one or more cases a probe could be carried from the depression above to the cyst cavity below. All ran in a downward, or downward and outward direction. When communication with the air had occurred, by examination or by an ulcerative process, pus would be added to the retention products.

I pen these lines, not on account of the danger to life (for observation teaches that this does not exist), but to direct attention to a subject little written about, and that I may, perhaps, save some fellow-practitioner that degree of mortification that comes of misdiagnosis, for there is a dearth of literature in regard to tumors of the coccygeal region.

I was invited upon one occasion, by two very intelligent gentlemen of the profession, to witness an operation for caries of the sacrum or coccyx. When I saw the case I observed a dimple or depression near the sacro-coccygeal junction. I suggested that the case was not one of caries or necrosis, but that a dermoid cyst was to be incised and curetted. A few moments only were needed to verify the diagnosis I had volunteered.

The preceding will show that these tumors may be mistaken for abscesses of the connective tissue of the coccygeal region; may be mistaken for abscesses denominated isichio-rectal; may be mistaken for fistula in ano. I think a case of abscess (?), once upon a time, was brought to my friend, Dr. Wyeth, of New York, that proved to be dermoid cyst of the ano-coccygeal region. Other conditions, benign or malignant, may be thought present when, in truth, only a dermoid cyst or tumor is to be dealt with.

My experience leads me to the inference that the condition I imperfectly present to you is of more common occurrence than the writing in text-books indicates.

I might write more upon this subject, but enough has been said to put the hearer on his guard when investigating disease or tumors in the region referred to in this paper.

The treatment will suggest itself: Incise the tumor; curette with a Volkmann's spoon, and treat with the most approved methods of antiseptic procedure. Nothing more nor less is needed. If one wishes, after thorough removal of the deviated growth, the parts may be approximated, with reasonable hope of union, and more rapid cure than by the former method.

With this brief and imperfect review of the theories held to-day respecting tumors, as I have culled them from the memories of reading, and the clinical inference presented, drawn from my experience with dermoid cysts of the coccygeal region, I end this paper with stating that these cysts or tumors have been found in various localities other than that to which I have directed your attention; but you will not find much more than bare mention made of them, and then, seemingly, as among the earlier writers, merely such remarks as will gratify a curiosity attaching to such manifestations of abnormally located evidences of deviated development.*

There is still another theory: The microbic. I merely make mention of these two last hypotheses of tumor genesis. How they will be received by the profession, is a problem for future solution.

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*Note.—Since the preparation of the above paper, I have seen, in the *Annals of Surgery* a review of a volume by W. Roger Williams upon "The Principles of Cancer and Tumor Formation." In the chapter on reproduction the author states: "I have arrived at the important conclusion that the processes of repair and reproduction of lost parts, and the various morphological variations, including bud-cancer and tumor formations, are nothing more nor less than abortive attempts of certain cells to reproduce new individuals. Whence it follows that the laws of reproduction are also the laws of cancer and tumor formation."

FRACTURES OF THE FOREARM.

By John Brownrigg, M. D.,

Columbus, Miss.

Believing that we have not attained a perfect method of treating the most common fractures of the forearm, I present for your consideration some new appliances which have been used with good results.

In these fractures it is best to prevent flexion, extension, pronation and supination of the forearm. It is also necessary to keep the forearm splints parallel to each other, transversely and longitudinally.

Colles's and Barton's fractures require a different appliance, which will be described separately.

The roller bandage has done so much harm in unskilled hands, that I have abandoned its use except on the hand.

With the elbow flexed at a right angle, the inside splint should be a little wider than the forearm, and long enough to extend from behind the elbow to the metacarpo-phalangeal articulation, and should be cut out under the thumb. The outside splint should be of the same width, and long enough to extend from behind the elbow to near the styloid process of the ulna.

Two pieces of the same thickness as the splints, and one inch wide, should be shouldered into the outside and inside forearm splints so as to present a plane surface with them, and secured to the splints with little nails, so that these pieces will be at right angles with the splints, and opposite

the axis of the arm, and long enough to extend up the arm to below the prominence of the deltoid muscle.

To these inch-wide pieces are tacked, next the arm above the elbow, two bands of tar-board, wide enough to envelop the arm and meet above the forearm at the elbow as flexed, and extending upward as high as the inch-wide pieces. If higher, they will be pushed down by the prominence of the deltoid muscle, and the splints with them, so that the bones will be bent at the point of fracture. The pieces of tarboard should be soaked in hot water so as to be molded to fit the arm, and lined with cotton wadding and cloth next the skin.

The forearm splints should be cut an inch longer than necessary, and after the tar-board bands are tacked on apply the splints and mold the tar-board bands to fit the arm, and then cut the lower end of the splints off the right length.

The forearm splints should be notched on their outer edges, to keep the strips of cloth to be tied around them from slipping.

Strips of cotton wadding should then be laid on the side of the splints next the arm so as to fit the arm, in some places thick, in others thin, and a piece of cloth sewed around the cotton wadding and splints, drawn so tight as to cause the cotton wadding and cloth covering to present a slightly convex surface, as used by the late Dr. F. H. Hamilton on his forearm splints. Too much convexity is not desirable, as the bones may be pushed too far apart, particularly if the strips of cloth are tied too tight around them. There should be but little cotton under the hand and at the elbow.

When the bones are from any cause disposed to separate too far, a many-tailed bandage, applied at the point of separation and extending to the hand, will prevent it.

Apply a narrow roller bandage to the hand from the wrist to near the end of the fingers, apply the splints, and if they fit, bind them on with a few strips of cotton cloth, tied around the arm and forearm parts, so as to exercise gentle pressure.

These strips can be loosened or tightened by anyone as the arm swells or shrinks. These convex pads serve well to

keep the bones apart, but caution is required in their use, as by binding them too tight the bones may be forced too wide apart or pressed out of position.

When the ulna is broken near its middle, the upper fragment is sometimes drawn away from, and the lower towards, the radius, so as to cause a separation of the broken ends. It is at this point that ununited fracture often occurs. To prevent this, a strip of thin board, not quite so wide as the space between the lower edges of the forearm splints when applied, should be padded with cotton and rolled in cotton cloth, and placed underneath the strips which bind the splints on, so as to keep the ulna straight. This thin board should be of the same length as the outside splint.

The forearm should then be placed in a sling, with thin strips of wood sewed in its upper edges.

In 1885 I read a paper before the Mississippi State Medical Association, describing two rectangular splints, which I had used in these fractures, before I had seen Dr. John H. Packard's account of the use of an internal rectangular splint.

Dr. Scott's rectangular splint prevents motion of the elbow, pronation and spination, but does not provide for keeping the bones apart, and the forearm is in a position of forced supination, which is very uncomfortable.

Finding the straight rectangular splints disposed to slip down, I adopted those described above. Very moderate pressure is required, and it is difficult to displace them.

A many-tailed bandage should be tied around the hand and splint to keep the hand up.

BARTON'S OR COLLES'S FRACTURE.

All the fractures at the lower end of the radius, whether transverse or comminuted, or the oblique fracture first described by Dr. Barton, require extension and counter-extension. These cannot be obtained by using the hand as a lever, and the lower end of the ulna as a fulcrum, even when its semi-articulation with the carpus is not destroyed. The displaced fragments cannot be forced into position and kept there by coaptation splints, and if this should be accom-

plished, the amount of pressure required leaves the wrist and hand stiffened. Fractures near a joint almost always leave the joint stiffened unless early motion is resorted to. This inflammation is almost certain to attack the articulations of the carpus. Internal and external coaptation splints, no matter how shaped, prevent motion, and more or less pressure on the carpus is necessary. It is important to preserve the proper position of the lower end of the ulna in relation to the carpus. The loss of prominence of the styloid process of the ulna is due to twisting of the carpus with the fragment of the radius attached inward, and it is also drawn to the radial side of the forearm by the contraction of the muscles attached to the hand. This displacement of the lower end of the ulna is more marked when its semi-articulation with the carpus is destroyed. The contraction of the muscles causing this displacement should be resisted by extension and counter-extension. If one grasps the hand and twists it forcibly inward, a good idea can be formed of the manner in which this displacement occurs. If the muscles of the forearm are resisted by extension and counter-extension in the direction of the axis of the radius, there will be a tendency to readjustment of the fragments, and with very little lateral support this can be accomplished.

For this purpose I use a splint composed of an iron bar, sufficiently strong to prevent motion of the elbow, and keep it flexed at a right angle. The bar extends from below the prominence of the deltoid muscle to the elbow, where it is bent so as not to press on the elbow, thence along the radial side of the forearm, which is between pronation and supination, the thumb being upward, to beyond the end of the first phalanges, the hand being flexed, where it is bent downward at a right angle about three inches. Where the bar passes over the thumb it is bent upward, so as not to press on it. In front of the arm a tar-board splint or band is riveted to the bar, wide enough to extend from the top of the bar to near the forearm, and long enough to nearly envelop the arm.

To the forearm part of this bar is secured a similar tar-board splint, by two strips of sheet iron, rivcted to the tar-board splint and bent loosely over the iron bar, so that the splint can be made to slide up or down on the bar. This tar-board splint should be as wide as the forearm on its inside and a little over half as wide on the outside of the forearm, care being taken that it is not wide enough to press on the styloid process of the ulna. It should be long enough to extend from near the elbow to the lower end of the radius.

The hand should be flexed loosely, the ends of the first, second and third fingers resting easily on the ball of the thumb. A roller bandage about an inch and a half wide should be passed around the wrist three times and stitched. A broad band should be stitched to the bandage around the wrist on the back of the hand and carried around the flexed fingers and stitched to the bandage on the inside of the hand at the wrist, to retain the fingers in a flexed position. The object of this is to preserve the parallel position of the metacarpal bones, and to prevent their being folded inward upon each other by the extension band described as follows: A belt cut biassed to fit the hand near the carpus, and buckled securely so as not to slip over the hand, is applied. Two rings of brass or other metal are sewed to the lower edge of this belt, one on the outside and the other on the inside of the hand. Extension is obtained by a cord passed first over the bent lower end of the bar, the ends being then passed through the rings and tied over the bent end of the bar. Counter-extension is obtained by the pressure of the tar-board splint against the arm above the elbow.

The tar-board splints should be lined with cotton wadding and cloth next the skin, and secured to the arm and forearm by many tailed bandages, the ends tied together. After the cord is tightened sufficiently, the forearm tar-board splint should be slipped on the bar toward the hand, until the lower end reaches near the carpus, and can be made to act as a coaptation splint at the point of fracture, but only gentle pressure is required, the contraction of the forearm muscles

causing the displacement, being resisted by extension and counter-extension.

Sometimes a narrow roller bandage is required to keep the hand from swelling.

Constant slight motion of the carpus is permitted. When the splint is applied the thumb should be under the iron bar. This can be secured by applying the belt around the hand so that the ring on the back of the hand will be near the thumb, and the one on the palmar side nearer the little finger. This causes the hand to be twisted outward, which is the reverse of the abnormal position resulting from the fracture.

If greater lateral pressure should be required, it can be obtained by two pieces of thin board placed transversely opposite the point of fracture, one inside and the other outside the forearm, the end projecting a little, so that cords can be tied around them below and above the forearm. These pieces will press as required on the tar-board splint.

I have only had to resort to this in a case of ununited fracture of eight weeks' standing.

THE TREATMENT OF STRICTURES OF THE URETHRA BY ELECTROLYSIS.

By S. M. Hogan, M. D.,

Union Springs, Ala.

To Dr. Robert Newman, of New York, we are indebted for many valuable suggestions in regard to this treatment, and especially to the proper use of the current.

Prior to his investigations, there were many unfavorable, disastrous, and even some fatal results—produced by using an improper current, *i. e.*, using the wrong electrode (the positive) in the urethra, or using too much electricity, cauterizing the parts, producing inflammation, which resulted in sloughing with its attendant disastrous results.

In the treatment of strictures of the urethra, it is only necessary to dissolve the cicatricial tissue by the chemical action of the current, and it is claimed that this can be done without generating too much heat, by using a current of great intensity but with little quantity, using small plates and weak fluid.

Dr. W. T. Belfield, of Chicago, who, after treating thirty-seven cases of stricture of the urethra by electrolysis with the most gratifying success, and who now uses it almost exclusively, (except for strictures located within an inch of the meatus, or for strictures of large calibre in the penile portion of the urethra,) summarizes the advantages he has experienced as follows:

"It is applicable to strictures at any point in the urethra.

"Any stricture or succession of strictures, however rigid, or cartilaginous; however long or tortuous; however tight (even if impermeable) can be safely and readily perforated.

"When properly handled it can produce no false passage or other local lesion.

"The effects are more enduring than either cutting or stretching, whether or not they are permanent, (as maintained by Dr. Newman,) my experience does not yet enable me to assert."

Although my experience has been limited, yet the character of the cases has been such, that I think I am fully justified in endorsing all that Dr. Belfield has claimed for this treatment.

Now, to arrive at such excellent results, it is absolutely necessary that we bear in mind that it is the purely dialytic effect we wish to produce and this with as little heat as possible, and by following the directions of Dr. Newman, success alone can be assured; which are as follows:

"Before operating, the susceptibility of the patient to the electrical current should be tested.

"The problem is to produce absorption and not cautery; therefore, weak currents at long intervals are best.

"The best position for the patient to assume during the operation, is that which is most comfortable to him and to the operator. It may be the erect or recumbent.

[I prefer the recumbent.]

"Anæsthetics are to be avoided, as it is better to have the patient conscious and able to tell how he feels. Care must be taken to keep the electrode in line, so that the point will not deviate or make a false passage.

"Force should never be used. The bougie must be guided in the most gentle way and electricity be allowed to do the work.

"During one *séance* two electrodes in succession should never be used.

"It must not be forgotten to stop the current before withdrawing the electrode; otherwise, acute pain will be induced in course of the urethra. Pain should never be inflicted during electrolysis, therefore it should never be applied when the urethra is in an acute or sub-acute inflammatory condition.

"It is better to leave a little urine in the bladder. It serves to diffuse the stimulus and it is more agreeable to the patient than when the bladder is empty."

While it is very desirable to have a fine battery, a milliampèremeter and a selective switchboard, etc., yet they are not absolutely necessary.

The battery that I am now using (and one with which I am very much pleased) contains twenty cells. Zinc and carbon plates. These plates are round, about four and one-half inches in length, and one-third inch in diameter. The fluid is composed of:

℞ Acid Sulphuric.....℥v.
Potash Bichromate.....℥vi.
Water... ....Oiii.
Mix.

This should be diluted about one-third if used when freshly prepared, and the plates stould be perfectly clean and all of the same size and length. The conducting cords should be extra long and by having one of them bifurcated, it will enable you to bring any number of the cells into the circuit without making it unpleasant for the patient by breaking and connecting the current.

I use Newman's electrodes and prefer them to all others.

Now, having everything in readiness, select your electrode and pass it down to the stricture and connect it to the negative pole at the first or second cell, using the bifurcated cord to make the connection. Keep it steadily but lightly pressed

against the stricture and in line with the urethra. Then connect the first cell, or positive pole, with a carbon electrode covered with a large sponge dampened with warm water and apply it to the back or the hip of the patient. Now increase the number of cells in the circuit by using first one, then the other end of the bifurcated cord attached to the negative pole, until you detect the escaping of gas bubbles or the patient feels a warm or slightly pricking sensation in the urethra. Now by keeping the electrode lightly pressed against the stricture you will soon find that absorption is taking place, the stricture yielding and the electrode advancing, and at times, as Dr. Newman says, it will fairly jump through the stricture. At other times, it will require several *séances* to pass the stricture, but with perseverance and patience and a proper adaptation of the electrode and current any and all can be passed.

When passed, the electrode should be slowly withdrawn until the insulated point engages the stricture again, when it should be allowed to remain several minutes to soften or dissolve the cicatricial tissue. Then reduce the current to zero and withdraw the electrode.

These *séances* may last from ten to thirty minutes and may be made every seventh day; but Dr. Newman prefers to make them at intervals of from two to four weeks, gradually increasing the size of the electrode until all the strictures are removed.

From the foregoing you will observe that I have followed very closely the directions as given by Dr. Newman, but although while familiar to you all, they are of so much importance, they will surely bear repetition. And not only this, if we wish to attain the success he claims to have had, we should do as he directs, although we may differ with him as to his theory of cure.

I am free to acknowledge that I am very skeptical about it. I am not prepared to accept the doctrine that with small cells and weak fluid these cases are cured by absorption alone. I am more inclined to the opinion that not only

absorption but softening and dilatation are also material elements in the cure, and that the main or best reason for using small cells and weak fluid is that we can regulate the quantity of the electricity to a greater nicety. And while I have no reason to doubt the permanency of his cures, the cases I have treated are of too recent date for me to be satisfied on this point.

Of the cases treated, three were dismissed, or dismissed themselves, after the urethra was enlarged to a No. 20, F. On first examination none of them would admit of anything larger than a filiform bougie. I commenced the treatment with a No. 10, F. electrode and the treatment required from three to six months.

One of these cases was in a female, traumatic in character, including the meatus and extending into the urethra three-quarters of an inch. In the treatment of this case, there was a variation at the different *séances* of from six to ten cells, and at all there was an escape of gas and the parts changed their color to a creamy appearance before the electrode made any advance. There was an evident softening for nearly a line around the electrode and the tissues were to a very perceptible extent dissolved. Yet I saw nothing afterwards to convince me of a retrograde metamorphoric action, neither did there seem to be any inflammation produced at the time of the treatment or afterwards.

I was exceedingly anxious to continue the treatment of this case until I could at least pass a No. 30, F., but she insisted that she was cured and refused further treatment.

I have had three other cases; one of which was a Mr. J., aged sixty. Strictured eight years. Caused by gonorrhœa. Had a urethral fistula six years ago, since which time a large number had formed. Many had healed. There are only four now but the urine escapes at only one. All of these fistulæ are in the perinæum and there is an immense amount of indurated tissue around them extending from the scrotum to the anus and even implicating the scrotum. Prostate gland very much enlarged, patient very much emaciated and

very feeble; bowels regular, although he takes from thirty to fifty drops of laudanum frequently during the day. Has convulsions occasionally, simulating epilepsy. Has suffered for more than a year with chills and fever. Not a drop of urine has passed through the urethra in two years. An attempt had been made several times to treat him by dilatation, but after each operation would have urethral fever, and after recovering, would find that he was growing rapidly worse. At one of the operations a false passage had been made.

Upon examination, located the stricture in the penile portion of the urethra, about two inches from the meatus, but was unable to engage in it even a filiform bougie.

Although the prognosis in this case was so unfavorable I determined to make an effort for his relief.

On May 30, 1886, I commenced the treatment by using a No. 10, F. electrode, with six cells of a zinc carbon battery. After eight *séances*, using from six to eight cells of this battery, the electrode passed into the bladder and he was enabled to pass urine through the urethra, but about this time it became absolutely necessary for him to go home and he never returned for further treatment.

Another and very similar case was a Mr. W., aged forty, stricture, traumatic; injury received about eight years ago. About two years ago abscesses commenced to form in the perinæum which resulted in fistula; from this time on he grew rapidly worse. Several times his bladder had to be asperated; twice he had external urethrotomy performed, still he grew worse. In July, 1887 he made a visit to his father-in-law, and there he had to call in a physician, Dr. W. S. Harris, who sent him to me for treatment.

Upon examination we found the scrotum enormously enlarged and the lower third perforated with a fistula. There were also several in the perinæum and one on the inside of the right thigh. At each of these openings there were small projections or tumors, varying from one-fourth to three-fourths of an inch in length and about the same in heighth

and about an eighth of an inch thick. He was very much emaciated, weighing about 100 lbs. his usual weight being about 165 lbs. Has frequent rigors and high fever. Every half hour, day and night, he has to make the attempt to pass his urine, which comes in drops through several of these perineal fistulæ and is attended with very great pain. The prostate gland was very much enlarged. He was so emaciated that the bladder could be readily outlined—it was small, hard and sensitive.

In examining the urethra I found a stricture in the penile portion one and one-half inches from the meatus. All efforts to enter it with any kind of an instrument failed. On external examination it felt small and as hard as a whip-cord.

Seeing the utter impossibility of performing internal operation, or even an external one that promised any hope of a final cure, and having so favorable an experience with the previous case, I decided to commence the treatment by electrolysis as soon as possible. In fact, there was nothing else that offered any hope of cure whatever. But this man needed immediate relief. I therefore enlarged the most central and nearest fistulous opening to the bladder for the more ready and freer escape of urine. I put him on a treatment of quinine and tonics, and in a short time, although he had fever, I commenced this treatment by using a No. 10, F. electrode and six cells of the battery; time fifteen minutes; very little progress made.

This treatment was continued for three months using the same electrode, but sometimes I increased the number of cells in the circuit and also the time of the *séances*. I then had the satisfaction of finding that the electrode had passed to the prostatic portion of the urethra, and although I failed to make it enter the bladder, when I removed it, he passed a small stream through the urethra. Another month was consumed in working out the urethra with the same electrode. I then commenced with a No. 12, F., and used it about a month, and although I failed to make it enter the bladder, I could very readily pass a small rubber catheter.

The difficulty was caused as I think, by the enlarged prostate gland. I now used a No. 14, 16, and finally a No. 18, F., the largest that will possibly enter the meatus.

At the second *séance* with the No. 14. F., I passed it into the bladder, but it nauseated him very much and produced a decided shock. As this has happened twice with me, I shall be very careful never to allow it to do so again.

After passing the No. 12, F. electrode, convalescence was fully established and progressed, *pari passu*, with the enlargement of the urethra. The fistulæ have healed, the enlarged prostate has decreased to its natural size; his general health is excellent, and he has gained more than fifty pounds in weight and for the past four or five months he has been able to attend to business.

It will naturally be asked if I consider this patient cured. Practically I do. He says he passes a larger stream of urine than he ever did, and he is leading an active life. Time alone can settle the question of its permanency.

If, however, it should fail to be permanent, it is very evident to me that this treatment has accomplished what nothing else could have done; it has opened the urethra and made possible the older operations of divulsions or incissions. Even taking this view of the case, I can come to no other conclusion than that it will be an invaluable addition to the armamentarium of the Genito-Urinary Surgeon.

One more case I will report, because I think it will be profitable to us.

Mr.——, aged forty-one, very large and fleshy, nervous temperament, hemorrhagic diathesis; has had stricture for fifteen years, and during the last four or five years has suffered at times intensely.

I was called to see the patient on the 11th of last May, found him with rigors, high fever, delirium, and getting up every few minutes, attempting, but ineffectually, to pass his urine. I immediately put him in a tub of warm water and gave him a subcutaneous injection of morphine and atropia, which only gave partial relief to his sufferings. I then

attempted to pass elastic catheters of different sizes, but failed. I however detected a stricture in the penile portion of the urethra, about a half inch in front of the scrotal junction, about the diameter of a No. 14, F. Another, about one inch lower down and about the same size. The third, the impassable one, was about one inch from this. I finally, however, succeeded in passing one filiform bougie through it, which, in connection with several doses of chloral hydrate, enabled him to pass a small stream of urine, very much to his relief. Although I used the catheters in a gentle manner a slight hemorrhage was produced.

After this I continued to treat him for nearly three weeks, to prepare him for the more permanent treatment of these strictures, but he continued to grow worse and something else had to be done. Owing to the inflamed condition of the urethra and to his hemorrhagic diathesis, I decided that the danger would be too great to attempt his relief by dilatation or divulsion, or incisions, and, although it was contrary to the teaching of Dr. Newman, I decided to use the treatment by electrolysis, and on June 2, I used a No. 10, F. electrode with six cells of the battery, fifteen minutes. There was no pain whatever; hemorrhage about two ounces; he was very much excited; only slight progress made.

June 14—No. 10, F., seven cells, fifteen minutes; considerable progress noted; hemorrhage slight; patient not so nervous.

June 20—No. 12, F., seven cells, twenty minutes, slight bloody secretion. The electrode passed very near to the membranous portion of the urethra and he can now pass a good stream of urine—the largest, he says, for eight years.

I continued to use the electrodes about once a week, slowly increasing their size, and on July 29, I passed a No. 18, F. into his bladder, which caused nausea and shock as in the case of Mr. W. I can now readily pass a No. 20 F.

This case is still under treatment, but I regard the prospects for cure favorable.

There are other possibilities connected with this treatment that will bear further investigation, that is the severing these hard cicatricial bands after the calibre of the urethra has been enlarged, which would shorten very materially the time of the treatment and might also make the cure more permanent.

I have been making some investigations in this direction but I am not prepared to make a report on it now.

CASES IN SURGERY.

By R. M. Cunningham, M. D.,

Surgeon to Hospital, Pratt Mines, Alabama.

It has been said that the report of cases is the spice of medical journals. If this be true, how much more so it is in medical societies. That which the general practitioner is most interested in is the report of cases with which he has personal experience, to wit: The cases of ordinary practice. I fear that our justly eminent physicians and surgeons devote too much of their invaluable experience to the study and report of major operations and diseases. It is, therefore, left for the less learned and skilled to study those cases which are of almost daily occurrence. In the following selected cases from a somewhat large experience in general surgery, it is my object to bring out in each case an interesting feature in etiology, pathology, diagnosis, prognosis, or treatment.

Case I.

Gun-shot wound in back; fracture of seventh rib; secondary circumscribed empyema; aspiration; recovery; death eighteen months later from pulmonary consumption.

Thomas W., negro, fine muscular development, large frame, robust constitution, age 35 years, engineer, good family history. In July, 1886, was shot with a 38-calibre pistol ball, entering the back three inches to left of spine corresponding to seventh rib. Examination one hour afterwards.

No pain, no shock, no symptoms whatever except mental anxiety. Probe could not be introduced in recumbent position; patient directed to stand (the position when shot) when the probe readily passed through the muscles of the back down to the rib, and through the rib, showing a penetrating fracture of that bone, and stopped. Gentle pressure on the probe would cause an advance, and would then, on removal of pressure, return. The fracture in the rib was nearest lower margin. The bullet could not be found. Diagnosis: Gun-shot wound in back and gun-shot fracture of rib, the bullet not having penetrated the chest cavity. This latter conclusion was based on the absence of all symptoms, general and pulmonary, and the resistance offered by the pleura to the probe. Wound thoroughly washed out with carbolic solution, and hermetically sealed with plaster. Patient did well for eight days, not an unfavorable symptom, nor symptom of any kind. On the eighth day, suddenly seized with severe excruciating pain in left side. Rapid breathing, pulse 160, temperature sub-normal. No cough, surface cold, countenance distressed and anxious—in a word, severe shock—amounting almost to collapse. Counter-irritation, whiskey and hypodermatic injections of morphia. Patient soon rallied, all the symptoms improving and temperature rising to 104 degrees F. Diagnosis: Acute pleurisy, caused by entrance of bullet by ulceration into the pleural cavity. An examination of the wound revealed it to be entirely healed. There was not then, nor had there been, any symptom of pent up discharges. There had been no pain, swelling, heat nor fever. No pulmonary symptom. Next day a decided friction sound was heard in the left side behind. In a few days, dullness, absence of respiratory and vocal sound, up to the spine of the scapular and forward to the posterior axillary line. Hypodermic needle introduced and laudable pus withdrawn, revealing a circumscribed empyema. Aspiration in the eighth space, about four inches from spine, and one pint of healthy pus removed. Physical signs demonstrated expansion of lung. The general symptoms, fever, circulation,

etc., all improved. In a few days physical signs and general symptoms showed a re-accumulation of pus. Aspiration, and one-half pint of pus removed. Twenty days later a third aspiration, and about two ounces removed. After this the improvement which had already begun increased very rapidly, and in a few days the patient was as well as ever. The physical signs remaining were very slight dullness, and slightly diminished vocal and respiratory sound. Patient resumed his occupation and was in good health for a year, when he began to cough, have evening fevers, and going into a general decline. Physical signs: Left side (original site of wound)—negative. Right side—slight dullness, prolonged expiratory murmur, slight broncophony and increased vocal fremitus in right subclavian region. The symptoms grew worse, and the physical signs more prominent, until there was complete solidification of the upper lobe of the right lung. This solidification occurred in two or three months. It was plain, therefore, that tubercular consumption had developed, the physical signs in the left lung remaining negative. Patient died in six months after the development of the tubercular disease, and eighteen months after the original injury.

The interesting features in this case are:

1. The probable lodgment of the bullet against the pleura.

2. Its gradual penetration of the pleura by ulceration.

3. The limitation of the empyema.

4. The rapid and effectual healing of the bullet wound without sloughing, suppuration, or any unfavorable symptoms, notwithstanding the fractured rib.

5. The inquiry:—Did the consumption which was developed in the patient twelve months after the shooting have any connection with the empyema—the slight remains of the latter acting as a nidus for the lodgment and development of the bacillus tuberculosis?

That the bullet did not primarily enter the pleural cavity; that the purulent pleuritis was caused by the bullet and not by the entrance of pus as shown by the absence of all prior symptoms of suppuration; that the severe symptoms at first were mostly due to shock from the sudden entrance of a foreign body into the pleural cavity; that the rapid healing of the wound without suppuration or sloughing, is a justification of the closure of the wound; that the purulent nature of the pleurisy was due to the septic bullet, and finally, that it is more than probable that the consumption was due to the inoculation of the remains of the empyema with the bacillus tuberculosis, I believe the course, symptoms, and result of the case demonstrate.

CASE II.

Gun-shot wound in neck; fracture of the left pedicle and lamina of the sixth cervical vertebra; complicated by croupous-pneumonia; death.

B. H., a healthy mulatto woman, aged 22 years, married, mother of two children, was shot September 8, 1887, with a 38-calibre pistol ball. The ball entered skin under the chin, came out within one-half inch of entrance, entered left anterior aspect of neck, about midway of the vertical diameter, passing backward between the trachea and vessel and lodging in the left side of the spinal column. Patient seen about one hour after shooting. Slight hemorrhage and pain and very little shock. Patient partially intoxicated. Partial motor paralysis of left arm and leg. Sensation normal. A probe readily passed and located bullet as described above. Wound dressed antiseptically and morphine given per orem. Patient rested well during the night. On the following morning the bullet was removed with a common carpenter's gimlet passed along the track and screwed into the hollow end. Considerable force was required to dislodge the bullet. After the removal of the bullet the paralysis did not improve. It was evident, therefore, that the left anterior column of the spinal cord was injured, either by the bullet or fractured bone.

Wound was washed out and dressed antiseptically. Patient did well for eight days. No fever nor sweats. There was slight purulent discharge from the wound. Paralysis remained the same.

On the eighth day there was a severe chill, followed by high fever, cough, rusty sputa, severe pain under right shoulder blade. Pulse 120; temperature 105° F. Next morning there was a well developed case of croupous-pneumonia in upper lobe of right lung—the pneumonia rapidly spreading throughout the entire lung, and on the fourth day of the pneumonia the lower lobe of the left lung became involved, when the patient died.

POST-MORTEM.—Upper lobe of right lung completely hepatized; lower lobe semi-hepatized; lower lobe of left lung greatly congested; large thrombus filling right cavities of the heart. The track of the bullet presented a somewhat dirty and sloughy appearance, and the sixth cervical vertebra fractured as described in the heading. There was a slight laceration of the left anterior column of the cord; the spinal membranes were intact. No meningitis, nor other local inflammation. No injury to trachea, pneumogastric nerve, or œsophagus. The laceration in the cord was caused by bone.

The interesting feature in this case was its medico-legal aspect. The party who did the shooting was indicted for murder. Death undoubtedly resulted from croupous-pneumonia, and not from the wound. The question, therefore, was, did the wound directly or indirectly cause the pneumonia? In my testimony in the case, I stated that croupous-pneumonia was an acute, general, infectious disease, caused by a specific *materies morbi*—the nature of which was not known—and that a traumatism could not produce it; that the debility, shock, etc., might have acted as a predisposing cause, but could not have produced the pneumonia. The pneumonia was due, therefore, in my opinion, to an entirely independent and incidental cause, and was not, therefore, attributable directly or indirectly to the wound. Those who accept the theory that croupous-pneumonia is an "essential fever," a

"specific infectious" disease caused by "specific" poison, the disease having a "characteristic pulmonary lesion," will agree with my testimony.

Those who regard croupous-pneumonia as a "local pulmonary inflammation," will find difficulty in explaining how a wound such as has been described—which has practically neither anatomical nor physiological connection with the pulmonary structure, could produce so much "local pulmonary inflammation," as existed in this case. I call particular attention here to the fact that the pneumogastric nerve was not injured.

Notwithstanding that the immediate dangers had passed, to wit: shock, hemorrhage, meningitis, septicemia, etc., the end would probably have been fatal, as it is more than probable that caries of the spine would have resulted and hence death in that way. This question, as to what would have been the result, had the pneumonia not taken off the patient, was not raised during the trial. I will state further that croupous-pneumonia had been prevailing in the neighborhood during the spring and summer months.

CASE III.

Gun-shot wound of abdomen; expectant treatment; peritonitis; death.

W. B., white, Scotchman, miner, age 25 years, in good health, was shot in abdomen by a 38-calibre pistol ball on the evening of March 1, 1887. Patient walked some distance, assisting his wife in carrying some bundles. Was seen soon afterwards by Drs. Brown, Jones, and myself. Patient on bed; suffering no pain and apparently not much, if any, hurt.

Examination: A small opening in front and just below anterior superior spinous process of left ileum; probe introduced and passed toward the medium line of the abdomen, at very nearly right angles with the vertical, about four inches, and stopped. The probe apparently, and no doubt did pass in the layers of the abdominal walls. There was no pain,

shock nor other symptoms; very little hemorrhage. It was decided that the bullet had not entered the cavity. This conclusion was based, first, on the direction the probe had taken and, second, on the entire absence of all symptoms pointing to the wounding of the peritoneum or abdominal organs.

The wound was dressed with antiseptic cotton, morphine given per orem, and patient enjoined to rest quietly in bed. Patient had a good night. No pain, fever nor symptoms of any kind. About noon or some 18 hours after shooting, pain in abdomen, fever, fast and feeble pulse, muscles of abdomen rigid. Diagnosis: Peritonitis.

Patient died fifty-two hours after the shooting, and thirty-four hours after the development of the peritonitis.

POST-MORTEM.—A small opening located as described above, in wall of abdomen; gas and bloody serum, fecal odor escaping from opening. Incision in median line from ensiform to pubis. General peritonitis. About two inches from the external opening towards the median line was an opening in the peritoneum which communicated with the external by a passage running obliquely through the abdominal walls. Just opposite this internal opening was an oblong cut in the anterior wall of the bowel-ileum. This opening was one-quarter inch wide and about one-half inch long. About one-half inch from the aforesaid opening in the peritoneum was another, situated at the inner, posterior and inferior of the first. This was the exit of the bullet from the abdominal cavity, and was continuous with a passage in the direction of the thigh. It thus appeared that the bullet merely entered the abdominal cavity, cut a small hole in the bowel, reëntered the abdominal wall, within one-half inch of its entrance and passed downward toward the thigh. There was no lesion in the cavity except the one wound in the bowel.

This was indeed a most favorable case for operation. Had it been performed there is a probability that the man would have recovered. This case teaches the important lesson that in all cases of gun-shot wounds of the abdominal walls, regardless of the direction of the probe or absence of symp-

toms pointing to wound of the peritoneum or abdominal organs, the surgeon should ascertain beyond the shadow of a doubt whether the bullet has or has not entered the abdominal cavity, and if so, the damage it has done. In this case it would have seemed criminally officious to have opened the abdomen in search of the bullet or its injuries, considering the absence of all symptoms and the direction the probe readily took. The inflation of the intestines with hydrogen gas, as practiced by Dr. Senn, of Milwaukee, would no doubt have demonstrated the opening in the bowels. But where this is not practicable as is usually the case in the country, the surgeon should either enlarge the bullet opening, carefully following the track of the bullet until he *knows* it *has not* entered the abdominal cavity, or he should make an incision in the median line. These remarks apply, of course, to wounds in the anterior and lateral aspects of the abdomen. In all cases he should learn the course the bullet has taken and the damage it has done, and then repair the damage as much as possible—practically regarding all cases of wounds of the bowels as fatal unless relieved by surgical interference.

CASE IV.

Compound fracture of the left thigh; contusion of knee and laceration of leg; compound fracture of lower jaw; dislocation of sternal end of clavicle; fracture of right, second rib; contusion of arm and back in lumbar region; secondary amputation; recovery.

Squire L., a large, healthy, finely muscled negro, age 30 years, was run over by six tram-cars on the slope of a coal mine and sustained the injuries enumerated above. The fracture in the thigh was in the lower third, communicating with the outside world by means of a small opening, made, apparently, with the upper fragment. The tissues around the knee were considerably bruised; a lacerated wound three inches long on the front of the leg down to the bone. A large ugly laceration commencing at the angle of the mouth, extending backwards und downwards to the angle of the jaw; fracture

and comminution of the right horizontal portion of the bone. A large bruised spot in lumbar region, and on left arm just above elbow. There was also dislocation backwards of sternal end of clavicle, and fracture near sternum, of second rib.

There was considerable shock—patient almost unconscious. It was decided not to amputate. The wounds were all washed with sublimate solution, one to two thousand; the laceration in the face sewed up, and all the wounds dressed with iodoform and antiseptic gauze. Extension and counter-extension and the long splint completed the dressing for the fracture.

Patient reacted promptly, but the pulse remained very fast, from 120 to 140; temperature from 100 to 102. Patient did not suffer much pain, was somewhat delirious, and was very obstinate. At the end of a week the dressing on the jaw was removed and the wound was found entirely healed by first intention, notwithstanding it was lacerated. There was a slough about three inches in diameter on the back, and a smaller one on the arm. The leg at this dressing was not disturbed, as he made no complaint in that quarter. Four days later the dressing on the leg was removed. The wound in the leg was doing well; a large abscess had formed in the tissues around the knee; a large collection of pus on the anterior and outer aspects of the thigh; the wound in the skin had entirely healed. A free incision was made above the fracture in the thigh and a large quantity of pus, which had accumulated beneath the skin escaped; also an incision at knee, and a less quantity escaped. The pus cavities were washed out with sublimate solution and dressed antiseptically. There was no improvement in the symptoms. It was clear that the septicemia would soon prove fatal. Two weeks after the injury the thigh was amputated at the upper part of the middle third, by the flap operation. There was a large pus cavity occupying the entire lateral part and anterior of the thigh, up to the trochanter and almost to the groin, the matter being just beneath the skin; also a large cavity extending up the inner side of the bone—extra-perios-

eal to very nearly the neck of the femur. There was not callus nor apparent effort at union. A large drainage tube was inserted along the lateral aspect of the thigh, under the skin, almost to the trochanter; another laid across the wound and brought out at each angle; the wound was thoroughly washed with sublimate solution, flaps brought together and stump dressed antiseptically. Patient stood the operation finely, apparently without shock. The pulse continued fast, however, and the temperature remained about the same for a few days, until the slough in the back and arm separated and were removed, after which there was a general improvement in all the symptoms. Stump dressed on second day; drainage perfect; tubes washed out and stump dressed as before. Sutures taken out on the eighth day; primary union. Tubes removed on the tenth day. The one ligature on the twentieth day. The patient rapidly improved after the separation of the sloughs, which left healthy granulating ulcers, and made a good recovery.

The question of amputation in compound fracture is always a serious problem. He that saves life and limb deserves much more credit than he who saves life at the expense of limb. Usually, particularly in former times, the doubt—when there is any—should be given to the patient and not the limb. Antiseptic surgery, however, in my opinion entitles the limb to the benefit of the doubt.

My reasons for not performing a primary amputation in this case are:

1. The fact that there was no comminution of bone, nor contusion of tissues in the vicinity of the fracture, and that the opening in the skin was very small.

2. That amputation in the thigh is a serious operation, and that by antiseptic dressing I could probably overcome many of the dangers of compound fracture.

3. I was not absolutely certain that the wound in the skin communicated directly with the broken bone. I was satisfied that the knee joint was not injured, which proved to be the

case. The question is, therefore, whence came the suppuration in the thigh and along the bone? In my opinion it was due to direct violence, same as the suppuration in the connective tissue around the knee joint, in other words, a severe contusion. It will be noticed that the suppuration was above the fracture and just beneath the skin—while that in the deep structures of the thigh, along the bone, which alone communicated directly with the fracture, extending up almost to the neck of the femur. It is, therefore, probable that even if a primary amputation had been performed, this connective tissue inflammation would have taken place, and was no doubt due to the original violence.

CASE V.

Contusion of perineum; laceration of deep urethra; secondary operation; septicemia; death.

G. S., a medium sized, fairly stout negro, age 24 years, while cutting coal was injured by falling coal, the body being pressed down upon a lump of coal under the perineum. There was slight contusion of perineum and buttocks. There was slight shock and considerable pain in the perineal region; retention of urine and hemorrhage from meatus. Diagnosis: Contusion of perineum and laceration of deep urethra.

The usual procedure in laceration of the urethra is to introduce, if possible, a catheter, tie it in and treat the case expectantly. If this procedure is impossible, primary perineal section. In this case a soft rubber catheter with difficulty was introduced; blood, bloody urine and clear urine flowed from the catheter in the order mentioned. Catheter was tied in and expectant treatment adopted. Patient did well for a few days when chills followed by fever, sweats and all the symptoms of severe septic inflammation occurred. Perineal section promptly performed, followed by considerable escape of very fetid pus, connected tissue sloughs, urine and semi-clotted blood and clear urine. There was an extensive sloughing in the connective tissue from urinary extravasation, and various sinuses were present. The wound was washed out

with carbolic solution several times daily. Urine and pus and connective tissue sloughs continued to discharge through perineum, and death by septicemia in about one month.

CASE VI.

Contusion of perineum; laceration of deep urethra; primary operation; recovery.

———, a white man, age 45 years, fairly good health, fell from coke ovens on piece of iron and produced the above lesions. The perineum was severely contused; hemorrhage at the meatus; catheter introduced and bloody urine and afterwards clear urine, withdrawn. Immediate perineal section. There was an extensively extravasated urine in connective tissue; there was very little suppuration and no sloughing followed. Metallic bougies passed daily; wound rapidly healed and patient made a good recovery. This case was treated by Drs. Jones, Brown and myself. Patient subsequently died of catarrhal pneumonia, so I am informed.

The result of these parallel cases teaches that in all cases of contusion of the perineum and laceration of the deep urethra by external violence, particularly if there is much contusion and by a blunt instrument, we may regard that there is an extensive laceration of the urethra, and consequently extravasation of urine, which the catheter cannot prevent, and at once, the sooner the better, perform perineal section.

INDICATIONS FOR OPERATIVE INTERFERENCE IN CEREBRAL TROUBLES.

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The article which I had intended to write upon this subject would have been far more elaborate had not this unfortunate epidemic come upon us exactly at the time I had selected to commune with my professional brethren in a good old practical way. The great difficulty in the path of surgical investigation is the vague and indefinite glamour which specialism has thrown about it. And it is with peculiar pleasure that I hail the organization of an association like this, which represents, as once the immortal Bowling said, the grandest system of intellectual medicine the world has ever seen, (for the surgery of the Southern States of America has written its name on the highest pinnacle of glory). I shall endeavor rapidly and concisely to offer you what I believe to be the best basis of practical operation in cerebral surgery that recent operations have decided.

I shall begin by asking the question:

Under what conditions should the cranium be trephined?

Answer 1. In lesion of the ventricles.

In the ventricles of the brain two lesions are pathologically considered:

(*a*). Hemorrhage.
(*b*). Liquid effusions.

How are these to be determined?

Answer 1. By persistent hemiplegia.

Answer 2. By persistent hemianesthesia.

Answer 3. By hemiopia.

Answer 4. By ptosis, attended with general or special paralysis in voluntary muscles.

REMARKS.

I. Convulsions of a general character are of no localizing significance, and if even in an acute lesion they occur in such a lesion, and also in a chronic lesion, they prove the disease to be below the cortex, and out of the range of surgical interference. It might also in this connection be well to remark that conjugate deviation of the eyes from the side paralyzed, (or towards it if there are convulsions or much rigidity of limb) is of no localizing significance.

II. The second condition calling for the use of the trephine is:

Cerebral Hemorrhage.—This is almost always due to the rupture of an artery—very rarely to that of a vein. Veins rupture chiefly under such extreme pressure as attends trangulation, and under the same circumstances capillaries may give way and cause minute extravasation. In this case the trephine affords the only relief and the effect is brilliant.

III. *Arterial Occlusion.*—Two pathological processes may cause the occlusion of an artery. Embolism and thrombosis—the former of course being a plug from a distant source arrested where the artery by coagulation of the blood is at the spot obstructed. Both of these are generally relieved by trephining.

IV. *Abscess of the Brain.*—This, of course, is usually due to injury to the brain, but may, and does often, occur from

adjacent suppuration, especially bone disease, or to suppuration at a distance—generally in the lungs. General pyemia, disease of the ear, orbit or nose, may produce it, and any one of these causes will prove rapidly fatal if the trephine is not early applied.

V. *Cephalalgia.*—This is by far the most common of cephalic troubles calling for the use of the trephine. The indefiniteness of the term cephalalgia is the very point upon which I desire to turn the purpose of this article, *i. e.*, it is not all necessary to determine the exact point of lesion, inflammation or traumatism, before deciding to plant the trephine, but to this we shall refer later on.

Cephalalgia, like charity, covers a multitude of sins, and like charity it suffereth long. It is a most convenient, though unmeaning term. It is like neuralgia. You can throw it at your patients, and they will swallow it whole and be satisfied. I remember upon one occasion being called to the country to see a case which had baffled the diagnostic powers of the physicians in that "deestrict." Old women were sitting about the fireplace with arms akimbo, awaiting the oracular expression of "that 'ar city doctor." I soon found that I knew nothing about the nature of the case myself, but putting on a bold front, I declared emphatically that after a careful examination, I was firmly convinced that the patient was suffering from neuralgia.

> "And still the wonder grew
> That one small head could carry all he knew."

One old woman jumped up and shouted, "I told you so; I just knew it was new-ralijy. That 'ere doctor knows what he's talkin' of. He orter be practicin' in New Yawk to-day. You hear me tolk." So much for fame.

VI. *Traumatism.*—It is hardly necessary to state in a concisely written paper of this character that the skull should be trephined over the point of injury even in suspected fracture; therefore, I dismiss this summarily, believing it to be established as one of the axioms of surgery.

VII. *Epilepsy.*—In all the range of surgical therapeutics there is nothing which gives such satisfaction as the use of the trephine in epilepsy. I have rarely seen a case in which it was contra-indicated.

I shall now proceed to mark out all that is practically known about the localization of disease or injury for the purpose of trephining. The symptoms produced by brain lesions of course vary with the locality of brain structure, and it is only by such pathological expression that we can *a posteriori* determine the seat of injury or disease.

I shall endeavor to arrange these in a concise tabular form so that they may be referred to without wading through the great marshes of cerebral technology.

I. *Prefrontal Lobe.*—The parts in front of the ascending frontal are rarely attended with motor or sensory symptoms. Insanity is more frequent from lesions here than in any other locality. There is one prominent exception to the above rule, and that is the distinct motor aphasia which *invariably* points to lesion around the anterior limb of the fissure of Sylvius.

II. *Central Area.*—In this area (composed of the ascending frontal, ascending parietal and superior parietal) lesions cause motor paralysis as follows: Lesion in upper third, loss of power in leg; middle third, loss of power in the arm; upper half of lower third, loss of power in face; lower part of ascending frontal, loss of power in lips and tongue, and when on left side, aphasia.

III. *Parietal Lobe.*—Symptoms not well differentiated. Lesion recognized generally by the vagueness of expression. Among the symptoms which have been remarked are hemianesthesia, hemiplegia, defects of speech, amblyopia of the crossed variety, and more distinctively than all else, *word blindness.*

IV. *Occipital Lobe-hemiopia.*—These brain areas are all that come under the range of surgical relief.

I have stated them dogmatically, as I have not at present time to elaborate them fully.

In conclusion let me say that the trephine does less harm and more good than any surgical instrument. Fear of not localizing a lesion should not deter the surgeon from operating, for it does good anyhow, as the old negro woman said when she spanked all her children every Saturday night: "You haint done nothing bad to-day, but you're gwine to do it, and a lickin's good for you anyhow."

CRANIAL SURGERY.

By De Saussure Ford, M. D.,

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New impulse has been given recently to brain surgery, invited by the distinguished Ferrier, and later, Horsley, in their efforts to localize in the brain motor areas, and now it has been demonstrated, by many surgeons, that it is not so dangerous to use the trephine, nor does death ensue from the loss of cerebral material.

In March, 1861, as reported in the *Southern Medical and Surgical Journal*, a man was stricken by a large rock, comminuting the left lateral half of the frontal bone, which required me to use the trephine, in two places, to relieve the compressed brain. After the bones were removed, the membranes were discovered torn, and two tablespoonfuls of brain substance were collected. The man recovered without any trouble more than slight suppuration for a week or ten days, and has been, ever since, and is to-day, a perfectly sound man, without any brain aberration of any kind.

Recently, I have removed a part of the occipital bone, including the groove for the right lateral sinus, which was not injured, which pieces are here presented for inspection.

September 6, 1888.—W. S., German boy, nine years old, sustained comminuted fracture of left leg, middle third, and

comminuted fracture of left side of occipital bone, having been thrown from the railroad track by the cow-catcher of engine. Saw him an hour after injury—had not reacted, unconscious, pupils contracted, pulse small and frequent. Put up leg in felt splints, temporarily. There was a small lacerated wound of scalp, admitting end of little finger, which discovered fracture—sent for instruments and assistance. A flap in scalp, including pericranium, leaving wound in its centre, was dissected up, disclosing the character of fracture; the bones are presented for inspection, and it will be noted, that a considerable extent of the groove for the left lateral sinus has been taken from the skull. Ordinary antisepsis was used; parts irrigated with 1-3000 bichlor., and instruments taken from carbolic acid solution; but the lateral sinus was teased out of the groove with my finger-nail, which had not been toiletted by nail-brush or even pen-knife. These particles of bones were taken out principally with my fingers. There was no wound in the *dura mater*. The flap was sutured with ordinary silk, no drainage tube used and the wound dressed with absorbent cotton saturated in bichloride solution. The operation performed in the forenoon, two hours after injury; that afternoon I saw him and found him still unconscious, and that night at 8 p. m., just as I entered, he sustained his first convulsion, which was violent, lasting ten minutes, followed by tracheal *râles*, with failing pulse, and I announced to his family that he was dying. I turned him over on his belly, holding his head over the side of the bed, when an abundant watery fluid flowed from mouth and nostrils, relieving his lungs so conspicuously, that I turned him back to the bed on his right side. Within two hours his respiration became less embarrassed, and his pulse, feeble and frequent, continued from 142 to 140 until the following Monday, 9:30 a. m., forty-eight hours after injury. Temperature never above 102°, nor respiration above thirty after operation. Bromide, chloral, hyoscyamus and digitalis were used to quiet his restlessness, and from fifteen to twenty grains bisulph. quinine taken daily for ten days—milk diet, absolute quiet in dark

room. The first dressing was removed four days after operation, when slight suppuration of tuft of pericranium, which protruded through original scalp laceration. He went on to good recovery without any yet manifest disturbance in intellect or disposition, and is walking on his crutches. The case illustrates the value of early inspection of cranial fracture, and the prompt removal of loose bones, anticipating acute encephalitis and possible after-epileptiform seizures, and proves that this region can be successfully even trepanned without necessarily injuring the lateral sinus. More detailed history of daily course and conduct of the case will be given, if the Association will so allow in our published transactions.

Trepanning Twice on each side of Longitudinal Sinus, One Inch Posterior to Coronal Suture, with Removal of Intermediate Bone directly over the Sinus without Injury to it.

L, B., white, female, age twelve, was brought to me for surgical advice. The previous history of the case is forwarded with this *résumé* of my work.

November 28, 1888, (last Wednesday) the patient was carried to the amphitheatre of the Medical College of Georgia, and with the assistance of Dr. Holland, her physician, and Professors Geddings, Wright, Lamb, and other of my associates; after administering two ounces of whiskey, she was chloroformed. (I use chloroform with children and parturient women, but ether with adults, in surgical work.) An incision was made through the scalp and pericranium, leaving depressed old cicatrice, in its centre—this flap of sufficient breadth and length to use the trephine on both sides of sagittal suture, which was done, the intervening bone was taken from over the longitudinal sinus without wounding it, and the dura mater was not injured either by the Hay's saw or trephine. The students of the medical class, before whom the operation was performed, were allowed to view the blue sinus intact. To the touch the membrane was thickened, and the brain below *seemed* hardened, and had I not been

afraid (I frankly confess it), my judgement prompted me to ligate the sinus in two places, and incise the part between the dura mater, and possibly go further, and incise a portion of the cortical substance of the brain, in that region, which seems to be, according to Horsley and others, the motor area, which would explain the motor symptoms presenting in this child's trouble. I am most anxious to relieve the child, but if the recent operation does not suffice, am I warranted in a future effort to open the dura, and attack the cortical substance, as I have indicated, and as cases of others have been followed, with good results? The specimens of the bone removed are for inspection, when will be remarked, the unusual thickness of the skull for a child only twelve years of age. She passed through a two hours' ordeal very well, and after the flap was sutured with ordinary silk, the bichloride dressing applied, she was conveyed to her boarding house, where she rested well that afternoon and night, after repeated doses of whiskey, by Dr. Holland, to bring about reaction. I ordered three grains bisulph. quinine three times a day, to commence the next morning, and milk and egg-nog for diet, and ice water to drink, and 1-32 grain morphia, if restless, and apparently in pain. She did not require the morphia, and has not taken an opiate up to this time—three days after operation, Saturday evening.

November 27.—9 a. m., temp. 102; 9 p. m. temp 103. During the day *moved herself* in bed, with slight assistance. Has taken quinine and nourishment.

November 30.—9 a. m., temp. 99.2; 9 p. m. temp. 10.

December 1.—9 a. m., temp. 99.2; 9 p. m. temp. normal.

Bandages became disarranged, dressed wound with absorbent cotton and carbolic acid solution. No suppuration. She took one pill of podophyllin gr. ⅛, ext. nux vom. gr. ⅛, ext. hyosciami gr. ¼, ext. belladonna gr. ⅛, at 9 p. m. yesterday, November 30th, but not operating by 9 a. m., this December 1, she took two of the same pills, followed 4 p. m. December 1 by enema of warm soap-suds, resulting in large action from bowels. Her habit had been that of constipation, and she had

not been relieved for four days before the operation, but it being her habit, I did not consider it important to delay a day to "prepare her system." Since movement from bowels, she has flexed her thighs upon abdomen, the first time since last attack in September of this year, and to-night the doctor reports, that she kicked the cover from her feet and legs, with decided force. I have noticed, even thus early, a marked diminution in the chronic movements of the superior extremities, being certain that "the wish is not farther to the thought."

After reading the article by Horsley, "On Topography of the Cerebral Cortex," in *American Journal Medical Sciences*, April 1887, 342 *et seq.*, I am disposed to believe, with his experience and skill, my patient would have proved one of great interest, as verifying brain localization as far as motor disturbances are involved. I trust that this short *résumé* of this recent case, still under observation, may invite full, frank, free canvass by the Association, some of whom may encourage my study in this field of surgery.

May 19, 1889.—From recent accounts patient was strumming every day on piano.

PRACTICAL ASEPTIC SURGERY.

By J. W. Long, M.D.,
Randleman, N. C.

Mr. President and Gentlemen:

On this occasion I hope to speak not so much *to* you as *through* you to the great body of patient toilers throughout the South. Southern doctors are beset by many trying difficulties. In the first place, most of them are dependent upon their practice for a living, while many have large families to support; besides, those of us who do not live where we are accessible to a drug store are compelled to furnish our own medicines and surgical supplies. Add to these difficulties broken-down health—which is often the case—from overwork and exposure, and, I am sorry to say, sometimes from dissipation, and is it any wonder that the average Southern doctor buys so few new books and periodicals and so seldom reads them when he does get them? The subject which I shall endeavor to present to you to-day has invited so much speculation and given rise to so many varying methods, each claiming to be the right one, that our minds have become confused and we overlook the principles involved by considering the hypotheses and paraphernalia incident to the subject. If I can, even to a small extent strip this great question of some of its extravagances and impracticabilities and present it to you in a practical, everyday form, then I shall count myself most happy.

We all know that in these latter days the *technique* or management of accidental and surgical wounds is entirely different from what it was one or two decades ago. Formerly the operator expected suppuration; now he is disappointed if it occurs. Then surgical fever followed almost every operation as a matter of course; now its presence indicates some defect in the management of the wound. Aseptic surgery has come to be the order of the day, and it simply means surgical cleanliness as applied to the treatment of wounds. Aseptic surgery has made dangerous operations safe, and legitimized many heretofore unjustifiable procedures. It is the outcome of common observation that devitalized animal tissues when brought under favorable conditions *putrefy*. These favoring conditions are warmth, moisture and certain micro-organisms. The absence of any one of these conditions will prevent the fermentive changes which in the living animal result in suppuration and septicæmia. Now, I am not here to champion asepsis, nor to dispute with anyone the validity of its principles, for I consider that these have already been established upon an immutable basis; and he who does not believe in aseptic surgery must necessarily believe in septic surgery. Notice, please, that I did not say *anti*septic but *a*septic; for antiseptics are only methods, while asepsis is a science involving great and unvarying principles: the one may change, the other never. Carbolic acid and corrosive sublimate may be forgotten, iodoform may be relegated to the realms of obscurity, but surgical cleanliness will ever be counted the greatest safeguard to life and health that man has yet devised.

The object of this paper is purely practical, and the hope is earnestly entertained that aseptic surgery may be set forth in such a light, stripped of all its technicalities as well as of all unnecessary expense, that any regular doctor possessed of a fair knowledge of anatomy may at comparatively small cost fit himself to do in an aseptic manner all the operations which occur in everyday practice. After having once tried aseptic surgery and mastered its principles, I am sure no conscientious man will ever go back to the old ways of long finger nails and rusty instruments.

To this end I have devised two bags, the smaller of which is my daily companion, the larger being used only in the more important operations. Prof. Gerster presented to the New York County Medical Society a bag to be used in "surgical emergencies," and while it is a capital thing, it is not adapted to the everyday work of the average practitioner. My larger bag is somewhat like his. I have been led to the construction of these bags by the repeated annoyance which arises from not being prepared to do the operations, great and small, that constantly come up in my practice. Not only has this been true of myself, but I know numbers of good men who believe in asepsis and antiseptics, and would like to do their operations aseptically, but they are not prepared to meet the emergencies as they arise, so go along in the old slipshod way. Furthermore, they are deterred from trying to get ready by the controversies and mystery which surround the subject, and the supposed great expense of the necessary appliances. As a matter of fact, I do not know of one man in fifty who is prepared at any moment to amputate even a finger, or do an herniotomy, or any other operation in an aseptic manner.

The rules and formulæ of aseptic surgery are simple but comprehensive, and may be briefly stated as follows:

The proper cleansing of the surgeon's hands and arms and the parts to be operated on deserves the first consideration. The surgeon's coat should be removed, his sleeves rolled above the elbows, the finger nails carefully pared, and all dirt removed from under them by means of a sharp-pointed penknife. The hands and arms should then be scrubbed and soaked in hot water and soap. Lye soap is preferable because of its solvent properties. The hands ought to be kept in the water for at least five minutes, that the hard places and crevices may become thoroughly softened and cleansed. A stiff nail-brush is indispensable in cleansing the hands. After this the hands should be placed for one minute in a solution of corrosive sublimate, 1 to 1,000. During the operation a basin containing a similar solution is placed convenient to

the operator, who dips his hands into it whenever he chances to touch anything that has not been sterilized, as a chair, his nose, a sponge picked up from the floor, etc. This same care of the hands is required of all the assistants. Surgical cleanliness means more that some people imagine. I remember seeing a doctor, who does a large amount of surgery and who professes to believe in and practice antisepsis, apply an ointment to the lids in a case of syphilitic conjunctivitis, then examine and make application to a case of hemorrhoids, catheterize a patient, and finally operate for double pterygium —all without washing his hands either before, during or after treating these several cases. As Gerster says, "the new surgery of cleanliness does not tolerate pretense and imposition."

If possible, always have the patient bathe and change his clothing before an operation. When on the table the parts to be operated on must be carefully cleansed with hot water and soap, shaved, and finally washed with sublimate solution, 1 to 1,000. Towels wrung out of a warm sublimate solution should be arranged around the field of operation.

It is impossible to do work aseptically with instruments that can not be rendered aseptic. The ingenuity and workmanship displayed in complicating instruments is simply wonderful—double joints, screws, rough handles and every other device imaginable to make an instrument difficult or impossible to be cleaned. I am glad to note that modern surgery is demanding instruments more simple in construction, the revolution exhibiting itself in open joints and hard rubber handles. An instrument should have as few joints as possible; most jointed instruments can be made with one joint, and this must be an open joint, either like the American bullet forceps, which have the French joint, or the Jones joint. There are very few instruments indeed that cannot be made to come apart easily. Toothed instruments should have coarse teeth, with the angle between the teeth obtuse and rounding, so that all particles may be readily dislodged by a stiff nail-brush. Those instruments not having solid metal handles

should have baked-rubber handles. Such handles will withstand the effects of boiling water, which is the best medium for cleaning instruments. Wooden handles or rough handles are entirely unsuitable, and should be discarded. Even the name of the manufacturer should not be stamped on an instrument. This Sims dull curette (fig. 1) is a beautiful example of an

FIG. 1.

FIG. 2.

FIG. 3.

FIG. 4.

FIG. 5.

aseptic instrument, while the sharp curette (fig. 2) is a typical example of a non-aseptic instrument. Horn handles like this scalpel (fig. 3) are objectionable, as hot water causes the sides to spring away from the metal shank, leaving crevices in which particles of matter may lodge; we can never be sure they are clean. The Volkmann scoop (fig. 4) is also perfectly aseptic, while the periosteal elevator (fig. 5) is "a thing

of beauty and a joy forever." These few instruments were selected at random, and presented simply to show the difference between the perfect and faulty. I have been thus careful to particularize concerning the make-up of instruments for the reasons given above, and the additional fact that there is not a single pocket or operating case on the market, so far as I know, which meets the requirements of modern aseptic surgery. Every surgeon should select each individual instrument—don't buy anybody's "case," and see to it that in every respect each one is genuinely aseptic.

The care of instruments is an important item, and has given me much concern. Half an hour before an operation they should be placed in a five per cent. solution of carbolic acid. For small operations a shorter time and a three per cent. solution will do. Knife blades remain in the solution only a few minutes, as the acid dulls the edge. Immediately after an operation place the instruments in a pan and pour very hot, even boiling, water over them. They should then be scrubbed thoroughly with soap and a brush, and dropped back into the carbolic solution, from which they are taken and dried with a soft cloth. It is very necessary that all toothed instruments be carefully brushed with a stiff nail-brush, in order to remove particles of blood and *débris* which invariably lodge between the teeth. For transportation, instruments should be wrapped in a clean towel, or placed in a canvas case, as either can be washed, but a leather case can not be washed and causes instruments to rust. No rust speck should be tolerated. The rust must be removed or the instrument laid aside. For permanent keeping a dust-proof drawer or case in a dry room is the best place to prevent instruments from rusting.

I am constrained to specify the care of catheters, because of the imperfect manner in which they are usually cared for. Before using, the cleansed catheter should be placed in a three per cent. carbolic solution; a 1 to 1,000 sublimate solution may be employed for rubber catheters. In either case transfer the instrument to a solution of common salt, 6 to

1,000 (heaping teaspoonful to the quart of water, previously boiled), after which anoint it with iodoform ointment (gr. viii. to ℥i). After being used in a septic case soft rubber and woven instruments should be destroyed. To cleanse rubber catheters, wash them in hot water and soap, and flush by means of a small syringe; then wash and flush in the antiseptic solution. Metal catheters can be properly cleaned only by prolonged boiling (an hour), or by passing through an alcohol flame until all smoke and steam cease to issue from them. An observance of these precautions will greatly lessen the number of cases of urethral fever and catarrh of the bladder.

If we could always have our hands, instruments, the parts to be operated on, the atmosphere, etc., in the ideal aseptic condition, there would be no need of germicides; but, unfortunately, we can not be sure of this happy condition. Therefore we resort to the chemical antiseptics, by means of which we keep a wound aseptic, or render it so by sterilization.

Antiseptics.—For irrigation, disinfecting hands, preparing sponges and gauze, corrosive sublimate is the best and most convenient germ-killer. For the hands, arms, and parts to be operated on, solutions of the strength of 1 to 1,000 are necessary; while for irrigating ordinary wounds solutions of from 1–2,000 to 1–5,000 are strong enough. Irrigations of the greater cavities require the solutions to be of only 1 to 8,000 or 1 to 20,000 strength. The following formula will answer every purpose:

℞ Corrosive sublimate..... ʒi
Water (previously boiled) ..... f℥ii
M. S. Teaspoonful to one pint of water = 1 to 2,000.

Some add twenty grains of common salt to the above formula, which prevents the mercury from decomposing so soon. Tablets of corrosive sublimate containing the proper amount to be added to a pint of water may be purchased from any manufacturing chemist or large dealer. They are more convenient, but more costly, than the salt prepared as above. In all solutions boiled water is preferable, but not indispensable, in the majority of instances.

For disinfecting instruments and keeping sponges aseptic, carbolic acid excels any known agent. A five per cent. solution is made by thoroughly mixing one ounce of the acid with one and one-quarter pints of water; a three per cent. by adding one ounce of acid to two pints of water.

The *Thiersch solution* consists of boracic acid ʒi; salicylic acid gr. xv; water Oi. This solution may be used with impunity in the abdominal cavity or elsewhere, as it will cause no irritation.

No surgeon can afford to be without *iodoform.* Its desiccating properties render it invaluable in the treatment of the vast majority of wounds, both accidental and surgical.

I have given but a few of the well-known germicides, for the reason that if we thoroughly understand the use of a few they may be made applicable to every case, and such knowledge is preferable to having an imperfect knowledge of many. Besides, it relieves the mind of the tedium and strain incident to frequent changes; for when one habituates himself to the use of any particular thing, its application becomes a matter of course, and requires little thought.

Sutures.—Silver wire may be kept wrapped in a protective or in a metal cylinder. The cylinder is costly and not indispensable. Silk may also be kept wrapped in the protective. Both silver and silk are rendered aseptic by placing them in a three to five per cent. carbolic solution for half an hour, or by boiling for an hour. Catgut is made aseptic by soaking in the so-called oil of juniper berries* for twenty-four hours, then transferred to ninety-five per cent. alcohol, or it may be kept in the oil indefinitely. The bottle contains spools holding gut of several sizes, the ends passing through a perforated stopper, and any desired amount may be drawn from the bottle without removing the spools.

The best drainage tubes are of soft black rubber, with a lumen of one-sixteenth to one-half inch. These may be

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*In a private note from Dr. Squibb he says: "The best oil of juniper berries in the market is obtained by distilling the fresh twigs of a different variety of juniper from that which bears the berries."

kept in a tightly-corked glass jar dry, or in a five per cent. carbolic solution. Bone drains are useful in permanent dressings, and are kept immersed in oil of juniper berries.

Dressings.—To prepare sublimate gauze, divide say twenty-four yards of cheese cloth into four pieces. Double each piece several times, and tie a string around it. Place these pieces in water with two pounds of bicarbonate of soda and boil for an hour or more. Then rinse the cloth through clear water and place it in a solution of corrosive sublimate, 1 to 1,000. After twenty-four hours it may be wrung out and hung up in a dustless place to dry. For permanent keeping, either a stout jar, tight drawer, or can with the lid held down by adhesive plaster will do. Excellent prepared gauze may be bought at about fifteen cents a yard; but it can be made by anyone disposed to try at a cost of only about four or five cents a yard.

Iodoform gauze is made by sprinkling gauze freshly wrung from a 1 to 3,000 sublimate solution with iodoform from a pepper-box; Gerster's, or an ordinary tin box with perforated top, will answer.

Absorbent cotton can be purchased at small cost, or can be prepared in an emergency by dipping cotton batting in a fifteen per cent. boracic acid solution. (Boracic acid ℥v, water Oii).

Protective is a thin rubber tissue, and costs about fifty cents a yard.

Bandages, both cotton and flannel, should be made from cloth previously treated as described for gauze. As a matter of economy a cigar box will make an excellent bandage roller. Near one end pass a stiff wire through from side to side, and shape one end of the wire into a crank. Toward the other end of the box arrange three or four wires or rods so that the cloth will pass over and under them in succession. Every operating case should have one or two rubber bandages.

Sponges.—Florida sponges are cheap and are better than fine silk ones. They are beaten well and washed to remove

all grit; soaked for fifteen minutes in dilute muriatic acid; thoroughly kneaded in hot water and soft soap; rinsed through clear water till they lose the soapy feel; finally transferred to a five per cent. carbolic solution, where they may be kept indefinitely. After use in an aseptic case, sponges are cleansed by repeated washings in warm—not hot—water, and immersion for one hour in a 1 to 5,000 corrosive sublimate solution. Never use a sponge that has been used in a suspicious case, nor to dress a wound with; pellets of cotton are infinitely better, and can be destroyed when once used.

I have seen one little sponge do service in every case occurring in the practice of a distinguished (?) surgeon.

The irrigator is indispensable, the ordinary fountain syringe being one of the best for a surgical bag. On a pinch, the irrigating fluid may be poured from a pitcher.

In considering the types of dressings we will notice just three, with their modifications; and these keep the wound in an aseptic state by desiccation, sterilization or hermetical sealing of the surfaces, or by two or more of these principles combined.

Desiccation.—Small wounds, especially about the face and neck, may be kept aseptic by freely dusting them with iodoform, or equal parts of iodoform and subnitrate of bismuth. These drugs, especially the former, have the peculiar property of drying a wound by checking the secretions, while the secretions that do escape are rapidly desiccated to a pasty crust, which protects the wound from contamination by infectious substances, and in turn is rendered aseptic by the antiseptic properties of the powders. When there is much oozing the parts should be dusted every half-hour until a crust has formed.

Sterilization.—By this is meant the moist dressing. The wound is gently packed with gauze squeezed from a fresh sublimate solution, 1–1,000 or 1–2,000. The field of operation and contiguous parts are lavishly padded with gauze and cotton previously treated as above, the whole being covered by a piece of protective, held in place by a

roller bandage. This dressing will absorb discharges more readily than the dry dressing, and is applicable in cases in which we may expect profuse oozing, or fear the drainage tubes will become clogged. When no impervious outer dressing can be had, the gauze may be kept moist by pouring a drachm or two of an antiseptic solution into it every half hour.

Desiccation and Sterilization.—These two types of dressing are happily confined and modified in the *dry dressing*, in which the wound and parts around are thickly covered with gauze and cotton previously sterilized by chemicals. A few strips of iodoform gauze are laid directly over the line of incision to facilitate the drying of the deepest portions of the dressing. No protective is applied to the outside, as the free access of dustless air is necessary to hasten the drying process.

Schede's modification of the dry dressing.—The prime object in this dressing is organization of the blood-clot. Asepsis must be perfect. A piece of protective just a little larger than the wound is laid directly on the parts, and iodoform gauze thickly applied above this. No protective is used on the outside of the dressing.

Hermetical sealing of the wound.—I do not think any paper relating to the modern treatment of wounds complete that does not give credence to the hot water method, so ably promulgated by the late Dr. Varick. This is specially indicated in amputation wounds, and consists in applying water only a little below the boiling point to the freshly-cut surfaces until they are thoroughly glazed with a coat of albumen. This effectually occludes the mouths of all lymphatics and small vessels, including the capillaries, so that contamination is impossible. The parts are next brought together, and little dressing is applied. The success of this method is truly wonderful. Small skin wounds may be hermetically sealed by touching them with acetic acid.

Having discussed the prerequisites of modern surgery, and the object of this paper being purely practical, I will now ask

you kindly to examine these bags, which you will find contain everything that aseptic surgery really demands. Take the smaller bag first. You will observe that it is only an ordinary leather satchel about twelve inches long; that it is carried by the handle or a strap thrown across the shoulder. On opening it we find a leather strap sewed in loops along the sides, and containing the following articles, to wit: Gerster's iodoform box; a two-ounce bottle of chloroform, with a notched stopper tied to the neck; a two-ounce bottle containing the corrosive sublimate mixture; two ounces of carbolic acid; a half-ounce of Churchill's tincture of iodine; a half-ounce of four per cent. solution of cocaine, and a small pipette; hypodermic syringe, tablets of morphine, and a small exploring-needle; a stiff nail-brush; litmus paper; small test tube; a g. g. s. vial of nitric acid, wrapped in absorbent cotton; and two ounces of glycerine, with twine tied around the neck of the bottle for making vaginal tampons. A plain sack, about six by eight inches, holds one or two ample pieces of protective, a yard or more of corrosive sublimate gauze, and a large piece of borated cotton; or these may be wrapped in oil-paper. In the bottom of the bag a narrow Esmarch and several cotton bandages. There is also a plain cloth case containing such instruments as one may wish to carry. A little side-pocket holds needles, silk, pins and safety-pins, the former two wrapped in protective.

This arrangement of the various articles enumerated is very simple and convenient; besides, it leaves the body of the bag for extra instruments, an unusual amount of dressing, or anything else. This bag soon paid for itself over and over again. Now I could not get along without it. With it any minor operation may be done after the style of modern aseptic surgery. I will give some examples, by way of illustration.

Case I.

March 1, Mrs. S., while picking up clothes for the wash, ran a needle deeply into the upper part of the right

hand. It gave her great pain. Her husband immediately telephoned for me, and the operation was conducted as follows: Pulling off my coat and rolling my sleeves above the elbow, I first thoroughly washed my hands and arms in hot water and soap; then I washed the patient's hand and wrist. Next, the instruments needed were laid in a small dish containing a three per cent. solution of carbolic acid—an ordinary goblet will answer every purpose for holding the small instruments necessary in such operations, and two fluid drachms of acid to a goblet of water approximates a three per cent. solution. Twenty minims of a four per cent. solution of cocaine were injected into the proposed line of incision. While the cocaine was being absorbed, my hands and the patient's hand and wrist were washed in a 1 to 1,000 solution of corrosive sublimate. The application of a rubber bandage rendered the hand and wrist bloodless. A short, deep incision was made directly over the point of entrance of the needle. The bloodless condition of the parts enabled me to see the needle passing upward and backward beneath the annular ligament, and it was easily extracted. The wound was washed in the sublimate solution; iodoform freely dusted over it, sublimate gauze applied, and snugly held in place by a roller bandage; after which the rubber bandage was removed. The entire operation was painless and bloodless. In a few days the dressing was removed—the wound had healed by first intention, without a drop of pus. Some one may say that extracting a needle is a trivial matter and not worthy the consideration of this society; but do you think that any one who can not extract a needle aseptically should be trusted to do a laparotomy or herniotomy?

CASE II.

Geo. A., about thirty years old, white, had a tumor the size of a marble on the inner side of the left ring-finger. It had been growing four years, since the finger had been hurt in a scuffle. The preparation of hands, patient, and instruments was as in the first case. Cocaine and the bandage

were used. A longitudinal incision displayed a dark looking mass, having the appearance of malignancy. The tumor extended through the lower end of the first phalanx and seemed to spring from the medullary canal; the bone had evidently been fractured in the scuffle four years ago. The mass was torn and trimmed out with forceps and scissors, leaving a healthy looking cavity. This was packed with iodoform gauze, and the whole finger thickly covered with sublimate gauze and absorbent cotton, held in place by a roller bandage. The wound rapidly filled up by granulations, the dressing being changed as often as it became soiled.

Now, kindly notice this larger bag, which is especially gotten up for major operations. It is a leather satchel about 17 inches long, with a stout handle. On the outside are strapped a nest of four oblong tin pans, the inner one holding Dr. Kelly's surgical pad and a piece of rubber sheeting, three by four feet. On opening the satchel you will observe that the partition has a side pocket containing two ample pieces of protective, and several envelopes holding respectively, silver wire, pins, and safety pins, silk and needles wrapped in protective; and another containing several powders for making Theirsch's solution. The other side of the partition presents loops for the following articles: Razor, shaving brush, nail brush, test tubes, bottle (in tin case) of bone drains, a four ounce bottle (in tin case) of carbolic acid, a two ounce bottle (also in tin case) of Churchill's tincture of iodine, a four ounce bottle of whisky, bottle of catgut in oil of juniper, a bottle of corrosive sublimate tablets, and a box of iodoform ointment. The body of the bag contains in one side a can (five yards) of corrosive sublimate gauze, an ordinary rubber syringe, a fruit jar holding sponges and rubber drainage tubes in a five per cent. solution of carbolic acid; a four ounce bottle of Squibb's best chloroform, protected by a box of wedge-wood; three shallow tin basins; two or three pie-pans; two quarter-pound cans of ether; a

wide rubber bandage; a cake of soap; and a number of cotton bandages. A fountain syringe to be used as an irrigator is rolled up and placed in the pans. On this side is also a chloroform inhaler, which is simply a wire muzzle covered with coarse cloth. These articles are covered by two or three towels (take plenty of towels with you) all held in place by two transverse straps. The other side of the bag holds a half pound or more of absorbent cotton rolled in a clean towel. Also an ether inhaler, which is a plain lamp chimney with a soft rubber face-piece. Both inhalers and the fountain syringe are kept in bags of rubber sheeting, as they are apt to get soiled and contaminate other articles in the bag. This leaves a large space for instruments, which are selected for each operation and placed in a cloth case or wrapped in a clean towel and stowed away in the bag just beneath the roll of cotton, which keeps them from jostling about and becoming injured. Some extra towels are in this side also.

Of course the arrangement in the bags of the various articles enumerated is entirely arbitrary and must be made to suit the convenience of each operator. The large bag contains no iodoform, cocaine, hypodermic or exploring needle, and no bandage or scissors, as they are all carried in the small bag; but might easily be added to the large bag.

CASE III.

On February 14, I was called by Dr. S. Redding to remove a tumor the size of a large orange from the hepatic region of Miss Hinshaw, white, about 26 years old. The tumor had a history of ten years' duration, and recently had begun to suppurate at its most prominent point. It was causing the patient and family a great deal of uneasiness. We proceeded as follows: A dining table was covered by a thick quilt and oilcloth. Upon a small table near by several of the pans shown in the large bag were placed and filled, one with five per cent. carbolic solution for instruments, one with 1 to 1000 sublimate solution for sponges,

and two with clear water, one being to drop instruments in as they became bloody, and the other for washing soiled sponges in before being returned to the sublimate solution. A strong sublimate solution coagulates the blood in a sponge and makes it hard to clean; besides the solution soon becomes turbid with blood. Therefore, during an operation, the sponges should be washed first in a vessel containing plain water and then replaced in the sublimate solution before being handed to the operator. An observance of these precautions in regard to the sponges and instruments will prevent confusion and add much to the orderly management of an operation. Another pan contained needles in a three per cent. carbolic solution ready threaded with silk, while another held the dressing—sublimate gauze, iodoform gauze, absorbent cotton, and roller-bandages. The iodoform pepper-box was near; a hypodermic syringe, charged with whisky, and a glass of whisky were also convenient. Our hands and arms having already been scrubbed in hot water and soâp, I proceeded to wash the field of operation, while Dr. Redding administered ether. After using soap and water on and around the tumor, the parts were sponged with a sublimate solution, 1 to 1000, after which towels soaked in a similar solution were arranged around the parts to be operated on. A small tub had been placed under the edge of the table to catch the water and blood during the operation, and a large pitcher was filled with 1 to 2000 sublimate solution for irrigation. Everything being in order, my hands were placed for one minute in a 1 to 1000 sublimate solution and a bowl of the same placed near by on a chair in which to dip the hands during the operation. The tumor was surrounded by two long elliptical incisions, and rapidly enucleated. Quite a quantity of blood was lost, owing to the fact that the tumor, while of a fatty nature, was channeled in every direction with sinuses filled with blood. After the enucleation one or two spurting arteries were tied with very fine silk, the wound irrigated thoroughly from the pitcher, and the sides approximated with numerous silk sutures. The

parts then presented a simple straight line of incision about eight inches long. No drainage was employed except a stand or two of silk carried beneath the sutures and projecting from either angle of the wound. While the patient's shoulders were gently raised her back was cleansed of blood and water. Iodoform was freely dusted over the parts, iodoform gauze laid along the line of the incision, sublimate gauze and absorbent cotton thickly applied over this; the dressings were held in place by a wide roller-bandage. At the end of two weeks the dressing was removed and the wound found healed throughout, except about an inch in the middle where the sutures had cut out—a retentive suture should have been used. The parts were sweet and healthy, and in a few days were entirely healed.

The dressing employed in this case is a typical example of the dry dressing, and the results of the case—no suppuration and no fever—show what may be expected from aseptic surgery. Below I append a case illustrating the moist dressing.

CASE IV.

Dr. W. A. Woollen asked me to see the following case, occurring in his practice: Sambo, black, 7 years old. The patient gave a history of acute inflammation of the right tibia, which commenced November, 1887. Some time before I saw the patient his leg had been lanced for the escape of matter by Dr. Stanton. The left femur was enlarged and tender, but no sinus existed from it. The affected tibia was discharging freely from three or four sinuses; the probe readily detected dead bone. May 2, with the kind assistance of Drs. Woollen, Fox and Walker, the following operation was done: The room having been previously scoured—floor, walls and ceiling—and all unnecessary furniture removed, a dining table and a small one were prepared as in case III; a bed was also prepared. A quantity of boiled water and a number of towels and bowls were provided. The

hands of operator and assistants were washed as heretofore described, our coats being first removed and a clean apron pinned around the waist of each. The instruments, and dressings and solutions, with basins of clear water, were arranged as usual. A fountain syringe was filled with 1 to 2000 sublimate solution and suspended from a nail near the ceiling. The edges of oil cloth covering the table were doubled so that the bloody water would be carried to a tub under the edge of the table. The little patient having had a general bath early in the morning, was laid on the table and anæsthetized. His leg was thoroughly scrubbed with soap and water, followed by the sublimate solution, 1 to 1000. The limb was elevated to the perpendicular for five minutes to allow the surplus (?) blood to gravitate into the body. It was then surrounded by a sublimate towel and an Esmarch bandage applied from the toes to near the hip; the lower end of the bandage being unwound, the ends were tied in a bow-knot above the knee. This rendered the limb bloodless and should never be omited in operations upon the extremities, unless positively contra-indicated. The operator's hands were again dipped in the sublimate solution, and the leg douched from the irrigator. An incision through all the tissues down to the bone, and extending from one sinus to another displayed abundant dead bone, pus and detritus. Thinking to chisel and scoop out the diseased parts and leave a trough of healthy bone, we proceeded cautiously with chisel and gouge. But the further we went the more dead bone we found; finally we discovered that the tibia was honey-combed with dead tissue from joint to joint. This left us with only two alternatives—amputation or exsection of the bone in its entirety. The latter plan was quickly decided upon, in the hopes of giving the little fellow a tolerable limb. The periosteum was easily stripped from the bone and the lower end of the bone broken loose from its attachments, a triangular piece of the lower end adhered to the cartilage and was broken off. In trying to remove this the

ankle joint was inadvertently opened, and it was thought best to remove the tibial cartilage in order to insure better drainage. The upper end of the tibia was loosened from its cartilaginous covering by means of a sharp chisel, and the remnants of bone scraped away with Volkmann's scoop; the knee joint was left intact except an insignificant nick in the synovial sac. During the time a stream from the irrigator had been playing upon the parts every few minutes. The wound, which was very extensive, being again thoroughly irrigated, was snugly packed with iodoform gauze freshly wet in corrosive sublimate solution 1 to 1000. Over this successive layers of sublimate gauze were laid in an orderly manner, and wet throughout from the irrigator. The entire limb was now enveloped in a thick layer of borated cotton, and this in turn covered by protective extending from the perineum to the tips of the toes. A roller bandage applied rather tightly held the dressing in place and controlled hemorrhage by pressure. Splints were adjusted to insure immobility of the joints and to keep the parts at rest. The last thing was to remove the rubber bandage and see that the blood returned to the toes.

In spite of this terrible operation—compared with which amputation of the parts would have been a comparatively small matter—this child's temperature never reached 102°. His appetite improved, and he began gaining flesh almost from the day of the operation. On the ninth day the parts were dressed, using the same precaution as to hands, dressing material, irrigation, etc., as in the operation itself. A little chloroform was given. The wound was found fresh and sweet, and rapidly filling up with healthy granulations—"new inflammatory formation" of Billroth. The limb has been dressed once a week since, and is now entirely healed, except a short wide hole at the ankle and the knee.

I show you the tibia removed from my little patient. This case strongly illustrates the triumphs of aseptic surgery. Where is the surgeon who would undertake to save a limb

under just such circumstances—after the old ways of surgery?

It may be objected that this paper contains little that is new or original. My answer is, that I do not come with untried theories and impracticable suggestions, but with those methods proven by actual experience—the only crucible in which the dross is consumed and the gold purified.

PLASTER OF PARIS IN THE TREATMENT OF FRACTURES.

By W. F. Westmoreland, Jr., M. D.,
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For hundreds of years surgeons have been casting about, and instrument and fracture appliance-makers have been taxing their ingenuity, for the purpose of devising some plan by means of bandages, splints, or fixtures, to hold the fragments of a fractured bone in their normal position, that union might properly take place, and thus prevent any deformity, so restoring the limb to its normal appearance and functions.

To mention the various devices, splints and appliances that have been suggested within the past century would fatigue without instructing and interesting you. They are on record in magazines, medical journals, books on surgery and fractures, and we must refer you to them for further information on this subject.

The object of this paper is not to discuss the various appliances adopted by different surgeons, but to present to you what I regard the best plan; one that shows results in every particular more satisfactory to the surgeon and patient than any other plan that has been presented in the past or present. I allude to the plaster of Paris splint. It is not every plaster of Paris splint (so-called) that is applied to a fractured bone that does well. It must be properly applied, of appropriate

material, with the fragments of the fractured bone properly adjusted, to give the results which are so much to be desired. For a time this splint was used only in simple fractures; but now, as will be seen later in this paper, we use them in compound comminuted fractures, with the very best results, often saving a life or a limb that was formerly sacrificed to the knife or other plans of treatment that resulted in the death of the patient. To obtain the best results, it must be properly applied; and I will now give you the details of its application and the plan that I adopt. For simplicity, I have divided this paper into "Preparation of Material," "Treatment of Simple Fractures," and lastly, "Treatment of Compound Fractures."

PREPARATION OF MATERIAL.

The bandage should be made out of ordinary cross-barred crinoline, that has had all the starch thoroughly washed out. The starch not only makes the crinoline very stiff and prevents its holding enough plaster, but also keeps the plaster from setting. Crinoline is better than gauze or cloth; the gauze pulls unevenly, and the meshes of the cloth are too fine to hold enough plaster to make a stout splint. Select the best plaster, and get it in unbroken cans; always test it by adding a little water to it, and see that it sets properly and quickly before using it. Put a small quantity of plaster on a table and rub it thoroughly into the meshes of the crinoline, and having an assistant to loosely roll the bandage as you rub. See that the plaster is evenly and smoothly distributed over the bandage. Rub the plaster into the bandage by hand. None of the machines that I have ever seen for this purpose, are worth the room they occupy. I prepare a large number of bandages at a time, having two or three widths, and pack them in a tin bucket, made air-tight. If placed in a dry place, they will keep for an indefinite length of time. Next, you will need flannel roller bandages; it will not do to use cotton under the plaster splint, as it is not comfortable to the patient, and is constantly kept damp by perspiration and

becomes offensive, and often excoriates the skin. I use a medium heavy red flannel for the bandages. Add to this a few pieces of perforated tin slips and a tape-line, and we are ready for the operation.

To better illustrate the application of a splint, we will take a case from practice. I receive a call that "Tom Jones had broken his leg. Come out at once and fix it up." "Get things ready to set a fractured leg," I call to my assistants. In five minutes the things are all packed in a satchel, and we are on our way to the patient. But pause a moment, and we will look at the contents of the satchel. It contains a bucket of plaster of Paris bandages, half a dozen flannel roller bandages, a pound of ether, a few narrow strips of perforated tin, a tape-line and a pair of scissors. We reach the patient, and find that Tom is a very stout, muscular man, weighing about two hundred pounds. An examination reveals an oblique fracture of the upper third of the right thigh, with two inches shortening. We immediately proceed to work; one assistant etherizes the patient, and the other gets things in order. An old sheet is put down by the bed to cover the carpet; on it, in easy reach, put a basin of cold water; place the plaster bandages close beside the basin, and have the flannel bandages at hand. While this is being done I secure a few large books, tie them securely together, then wrap a towel around a broom-stick and fasten it. By this time Tom is etherized. I put the broom-stick down inside the side railing of the bed between two of the slats, upright, while the end of the handle rests on the floor; an assistant holds it in this position. Now we pull Tom across the sides of the bed until his buttocks rest on the edge, while his legs hang over it, with the broom-handle between them, pressing against the perineum. I have Tom lifted, and put the book under his left buttock. This keeps him raised high enough for me to get around the pelvis with my bandage.

The assistant begins to make slow and steady extension; the counter-extension is made by the broom-handle, held firmly against the perineum. The towel wrapped around the

broom-handle protects the perineum from injury. The slow, steady extension is kept up until the fracture is reduced; I hold both legs up side by side, and satisfy myself by exact measurement with the tape-line, that both legs are the same length; keep up the extension all the time the bandage is being applied.

A flannel roll bandage is now applied, including the foot, and extending up the whole length of the leg and around the pelvis, taking care that the bandage lies perfectly smooth, without any wrinkles.

I take a plaster bandage out of the basin where it has been previously placed, end upwards, with water enough to completely cover it, and squeeze out the *excess of water*. As the bandage is taken out of the basin, have a fresh one put in, and it will be ready by the time the former is used. The evidence that it is ready for use is that the bubbles of air have ceased to escape. The plaster bandage is smoothly applied over the flannel in the same manner that an ordinary roller would be, making the reverses whenever necessary. Do not pull the bandage, or try to exert pressure. Carry the bandages up the leg, including the foot and around the pelvis, going up as high in the perineum as possible. The idea is to fasten the leg immovably to the pelvis. As the bandages are applied, rub them thoroughly with the hand to squeeze out any air that may have gotten between the layers, and to rub the soft plaster into the meshes of each succeeding bandage. Make a number of extra turns around each joint, and work in a piece or two of perforated tin, letting them extend from below the knee to the crest of the illium, to strengthen the splint at those places, where the greatest strain exists.

There is no rule as to the number of layers to apply, but it must depend upon the character and seat of the fracture, and the muscularity of the patient.

Within a couple of hours of the receipt of the injury the splint is applied, and when Tom recovers from the effects of the ether, he finds that he can turn in any direction, and occupy almost any position on the bed without pain. In

fractures of the thigh, I do not let them out on crutches for the first week.

There are several points in the application of the plaster splint that I wish especially to emphasize. The most important is the immediate application of the splint. This has been bitterly opposed, by most of our book-makers especially. They, almost without exception, advocate waiting for a greater or less time until the swelling has subsided. What are the advantages of waiting? It is claimed that by waiting till the swelling subsides, the numerous accidents that are said to follow the immediate application, are to a certain extent eliminated.

If there was no other argument, it suffices to say that the most of the men who advocate the plan of waiting, are the very men in whose hands these accidents occur, who report them, and who abandon this method with dissatisfaction and disgust. I think I understand this principle better than those with preconceived conclusions do. Experience is an excellent spyglass; but it has this drawback, that prejudice very often clouds the lens. One of our able book-makers is not even able to give personal experience as a reason for his prejudice, but he abuses and condemns this, as he does other splints, that he may better advocate his own.

His opinion, in this respect, reminds me of the founders of Lynn, Mass., who, after exploring ten or fifteen miles, doubted whether the country was good for anything farther west than that.

There must be some reason for these failures. What are they? Surgeons who adopt the plan of waiting before applying the plaster splint, will resort to any temporary expedient to control the fractured bone. Unfortunately, the fracture is never controlled by these devices. The fragments are not held in apposition, the sharp ends of the fragments are continually piercing the soft parts with every movement of the patient, and every spasmodic movement of the muscles. The result of this continued irritation is inflammation and swelling. After a time the swelling subsides sufficiently to suit the sur-

geon, and the plaster splint is applied. Later, and often before the bones unite, the swelling disappears—the splint being too loose to retain the fragments in position, the union is retarded, and when the bone at last unites there is often more or less deformity, and if it be an oblique fracture, the limb is shortened.

In the immediate application, the limb has not had time to swell, extension is kept up until the limb is enclosed in a splint that is accurately moulded to all the irregularities of the limb, both joints connected to the injured bone are fixed by the bandages being moulded into the bony prominences and depressions. This perfect adaptation of the splint to the inequalities of the limb absolutely prevents all motion, makes shortening an impossibility, and secures the complete immobility of the limb in a position in which it is put up. The fragments are held in perfect apposition. It is impossible for the ends of the broken bone to puncture and irritate the surrounding muscles. There are no spasms of muscles; no irritation; therefore it is impossible to have any inflammatory turgescence or swelling, and there is little danger of the splint getting tight. I have put up a fractured thigh where eight inches of the bone had been comminuted by a car wheel. Another, a compound fracture of both of the thighs by a street-car wheel. Another, fracture of the upper third of the thigh, with a fracture of the lower third of the same bone, with separation of the condyles. In neither of these was there any tightness, nor did the splints have to be removed, although in each case the splint was put on immediately after the injury. Watch the patient closely. Don't put on a splint and not see it for two or three days. Leave instructions that if the splint feels too tight, or the patient's foot or toes get cold or swell, to send for you; you may have to make many unnecessary visits, as I have done, but in these cases it is better to make numerous unnecessary visits, than to fail to make the one that is necessary.

I always use an anæsthetic in the reduction of any fracture that requires considerable force. The principal cause of

trouble in the displacement of fractures is the muscular contraction, and in reducing them, one main difficulty is to overcome this muscular action. No amount of extension or counter-extension will bring the fragments into position, much less retain them there, unless all muscular influence is removed. As this is true, the most natural way to overcome it is to etherize the patient. This does away with all possibility of having to use pulleys. The patient suffers no pain; is perfectly quiet, which is very important. There is no sudden contraction of the muscles at the wrong time. Never use pulleys to make extensions, or you will be apt to put up the limb in a bad position.

COMPOUND FRACTURES.

No compound fracture, by itself, no matter how extensive the comminution, is an indication for primary amputation, unless there is an accompanying irreparable destruction of the soft parts, including the large blood vessels. No doubt this seems an extreme principle to enunciate, but my experience in the treatment of compound fractures by this method, has convinced me that many limbs have been sacrificed to the surgeon's knife, which, had they been left (on), would have been of infinite value to the patient. Nor is any argument needed to convince anyone "especially the patient," that it is better to leave the limb in its natural position, than to remove it, and bury it forever out of sight. John Hunter said, two hundred years ago, "Surgery consists in curing a disease, rather than in a removal of it by mechanical means." But so differently do most people think on this subject, that a surgeon who performs the most operations, and gives most pain, is commonly thought the best.

When called to a compound fracture, I immediately etherize the patient, and am better able to reduce the fracture without muscular resistance, and retain it in perfect position; also to more thoroughly cleanse the wound.

Upon the thorough antiseptic cleansing of the wound and surrounding parts, and complete removal of all foreign and irritating matter, depends the quick and successful issue of the case, and in some instances, even the life of the patient.

In no cases that we are called upon to treat, is a disregard of antiseptic details so inexcusable as in these. As soon as I see the patient, I cover the wound with a towel wrung out in bichloride sol. (1.500), and while the patient is being etherized, I cleanse the surrounding parts with the same. When the patient is thoroughly etherized I reduce the fracture, making the opening larger, if necessary for the easy replacing of the bones. Then I cleanse the wound, cutting the tissues until I can reach and touch every part of the wound with bichloride sol. For this I generally use (1.500) and afterwards wash it off with a weaker sol. (1.2000). (Sol. always means bichloride). The instrument should be kept in carbolized sol. (1.30 or 40). All arteries should be ligated with cat-gut, and hemorrhages stopped and the wound closed with cat-gut sutures. Establish drainage either with rubber or bone drainage tubes, or cat-gut drains. Over the wound, place a thick layer of antiseptic gauze, and apply the flannel bandage, followed by the plaster of Paris, as previously described. I am no advocate of heavy dressing under the splint, as I think that is sometimes the cause of accidents, by preventing the splint keeping the bones in apposition. I would rather cut a trap-door in the splint and re-dress through it, as I have done successfully in a number of cases. I have been very much surprised that Scede's method of union has not been advocated in these cases, and I take this opportunity of advising it, especially in those where there is a great destruction of the soft parts. For, as Gerster says, its simplicity and independence of the presence or absence of a sufficient covering of skin, commends it to the surgeon.

Scede's method consists in making use of the organizing power of the moist blood clots. He thus supplies the wound with a plastic material, rendering both drainage and compression unnecessary. Important arteries should be tied, the

filling of the wound with blood being left exclusively to parenchymatous hemorrhages. When there is enough skin to close the wound, a small opening should be left at the upper angle to allow the drainage of superfluous blood; a piece of rubber tissue without any holes in it is placed over the wound, extending a small distance beyond its edge; this must lie closely and smoothly, and serves the double purpose of securing the complete filling of the wound with blood, and of preventing drying and evaporation, as well as keeping the bandage from absorbing any but superfluous blood. Then the rest of the dressing is the same as in other cases. It will be found that the blood in all parts of the wound will coagulate, and will be gradually replaced without further secretion, by a permanent tissue.

Dennis, in *Medical News*, November 13, 1886, reports 385 cases of compound fracture, with but one death, giving a mortality of less than one-third of one per cent. Previous to the adoption of antiseptic methods, the rate of mortality in the best of tables varied from twenty to sixty per cent.

OPERATIVE PROCEDURE IN TRAUMATIC EPILEPSY.

By J. T. Wilson, M. D.,
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Reflex epilepsy from traumatic injuries of the brain is not a rare trouble, and nearly every surgeon meets with one or more cases during his professional life.

I believe it to be proportionately the most curable of epilepsies. It is a very important affection and requires more study from the general practitioner than is usually given it. The great mistake is too frequently made by either not operating at all or waiting too long. In truth, the tendency in these cases is too frequently to neglect them, or prescribe only a palliative treatment. In this day of rapid surgical advance, when the hitherto sacred precinct of the cranium can be invaded with so much less hesitation than in former years, and with such comparative safety since the introduction of antiseptics, and with the brilliant record of brain surgery before us, where tumors and other pathological lesions are diagnosticated and removed with such splendid results as to astonish the world, no epilepsy caused by a depressed fracture should be permitted to progress without giving the unfortunate and wretched victim an opportunity to receive the benefits an operation might bring. Trephining does not aggravate the convulsions, and even if no benefit should result,

it does not leave the patient in a worse condition, when he has been properly prepared for it and the operation is carefully done under strict modern rules.

Though hemiplegia exist and its liability to remain as taught by the English surgeons should not deter us from operating and curing the fits if possible. In my limited experience in this disease the convulsions in a majority of cases are extremely severe, sometimes quite frequent and usually, to a great extent, one-sided; that is, the muscles of one side are nearly all involved in the spasm, though not in the same degree; the muscles of the face and upper extremity of that side are in most cases more affected than those of the trunk and lower extremity. Antispasmodics generally have less control over them than over the attacks from other causes, and their controlling influence does not last so long. In a majority of the cases that I have seen the general health was fairly good; they had morbid appetites and ate ravenously large quantities of food, and in all the cases coming under my observation, to the best of my recollection, the frontal, temporal and anterior region of the parietal bones sustained the injuries.

General treatment, attention to the general health with tonics, antispasmodics, and more especially the bromides, would always lessen the severity, and to some extent, the frequency of the attacks for a while; but the bromides largely, given for any considerable length of time, seemed to have a deleterious effect upon the health of this class of cases, and also seemed to have a more unfavorable influence upon the mental state, inducing early dementia. Persons predisposed to epilepsy, or very nervous and excitable, who are very susceptible to nervous shocks, are more liable to epilepsy from fracture or other injuries of the skull and scalp than those who are differently constituted.

In one patient a slight depression will produce it, in another a deep one will not, though both occur in the same locality; and in these nervous cases especially is an operation likely to do good, but in all it is of paramount importance to do the operation thoroughly.

In this connection I will report two cases illustrative of the object I have in view, that taught me an important lesson in regard to operating upon the skull and brain for epilepsy caused by an injury, and the lessons there learned served me a useful purpose in other cases.

CASE I.

J. H. O., American, male, age 40, married, occupation farmer. No reliable family history could be obtained, nor of himself, except that he had always been very nervous and excitable. General health fair, though not robust, of very nervous temperament. Was affected with chronic melancholia. Attempted suicide by cutting through his skull with the sharp corner of an axe, the wound being through the coronal suture, involving the frontal and parietal bones and about half an inch above the temporal bone of right side. Not succeeding by this means, he made another attempt a few days later by driving a No. 6 nail through the opening in the skull made with the axe. This nail was driven for more than an inch into the cerebral tissue. A physician saw him soon after and extracted it, dressed the wound by the ordinary, old-fashioned method; some suppuration supervened and the wound closed by granulation; paralysis of left side gradually came on; in six weeks was almost complete. A few weeks after the closure of the wound he was attacked with epileptic convulsions, and they recurred at intervals of one to three weeks for several months, and as time passed they grew more frequent and severe. Bromides in full doses seemed for a while to lessen the severity but not the frequency of the attacks, and finally seemed to lose all effect over them, and after the use of them for several months his digestion began to suffer, and symptoms of beginning dementia were strongly marked, but, strange to say, the paralysis slowly improved sufficiently to enable him to walk about with the assistance of a cane.

At the end of nine months from the reception of the injury the bromides were discontinued, he was put upon a

tonic regimen for about two weeks, when he was anæsthetized, the scalp shaved and a crucial incision made over the old cicatrix; as the scalp was dissected up and drawn back there was found a small oblong depression of the skull, and in the centre a small opening leading down to the dura mater, the bone having sloughed away. The trephine was used and two buttons removed embracing the entire length of the depression. A thick cicatrix of the dura mater was observed, but it looked healthy, and it was thought the epilepsy was caused by the depressed bone; it was not, therefore, interfered with, and after all the depressed bone was removed the wound was closed by the ordinary method; it healed readily under cold water dressings. He improved rapidly for three months, had no convulsions, general health improved, paralysis improved so much that he could walk comparatively well with the assistance of a cane and go wherever he desired; his mental condition also mended considerably, was more cheerful than he had been for months, and it was thought that his recovery would in a short time be complete. After the lapse of three months he began to get somewhat nervous and morose; appetite decreased and paralysis increased; his melancholia began to be markedly observed; he was restless, though not inclined to walk much; was troubled with insomnia, and complained of pain in his head at times that was quite severe. A marked change in his condition was easily observed. This change came on rapidly, and one morning after waking from sleep he was attacked with a severe convulsion, which lasted nearly two hours, and from which he never rallied, but sank and died in three or four hours.

The autopsy revealed a very much contracted calibre of the trephined wound, it having filled up with new tissue. The old cicatrix of the membranes was hard and firm, bulging a little and adherent to the skin around the wound. When it was incised an abscess of the brain was revealed, in which was found a small spicula of bone about half an inch in length. The brain tissue was softened and slightly discolored for perhaps a sixth of an inch around, extending into the cerebral tissue from the abscess cavity.

If, when this patient was trephined, the cicatrix in the membrane had been cut away, the part explored, the piece of bone removed and the diseased brain scraped away, it is highly probable that his epilepsy, and perhaps his paralysis, might have been cured and his life prolonged.

CASE II.

T. M., American, male, age 24, farmer. Fell from a tree a distance of twenty feet, striking his head upon a hard substance and sustaining a fracture of the skull involving the frontal bone of the left side near its junction with the parietal. According to the history obtained, he was said to have remained insensible for several hours, and confined to his bed for nearly three weeks. He gradually recovered, and in the fifth week after the accident, and after a day's labor of unusual severity, was attacked with epilepsy, followed by another seizure the day after. Another occurred after an interval of two weeks, then continued at irregular intervals for fifteen months, the attacks growing more frequent and severe, any unusual mental and physical exertion bringing them on. Very little benefit was obtained from internal treatment; his digestion was much disturbed by large doses of bromide; he had a morbid appetite; his intellect was dulled, and his case presented a gloomy prospect.

After about ten days' preparation, he was trephined, two buttons of bone removed, a small piece of the internal table lying loose was taken away; the wound closed up and healed without trouble; he was confined to his bed for ten days, and in fifteen days after the operation left his room. He seemed to be doing well until twenty-one days after the operation, when he had a mild epileptic attack, and these attacks continued with variable frequency and severity for four months, when it was again determined to resort to operative procedure, which was acccordingly done. A U-shaped incision was made, flap turned back and two buttons of bone removed from the sides of the old wound. A tense cicatrix

of the dura mater presented, and was carefully removed entire. The brain beneath presented no perceptible pathological lesion; the wound was washed with warm carbolized water; the scalp dissected up for nearly an inch around the wound, edges brought together with silk suture and closed up. The patient recovered without an untoward symptom; had five or six spasms in the following three months, when they ceased altogether, and after five years—when heard from a few months ago—he had no further trouble, but remains well and able to cultivate his farm.

These operations were not done under strict antiseptic rules, as the practice had not come into such general use as at the present day; but, in the second case, warm carbolized water was used. This experience taught me that in all cases of trephining, when the bone is removed the part of brain and membrane exposed should be carefully examined, and if a cicatrix exists, it should be removed, as also any foreign substance or pathological lesion of the brain should be cut or scraped away, under thorough antiseptic precautions. If hemorrhage occurs, and continues after washing with hot water, and if the bleeding vessel or vessels cannot be ligated, the cavity can be very carefully and lightly packed with antiseptic wool, care being taken that the packing be not too tight, as the pressure thus made might result in mischief, and as soon as the hemorrhage has been controlled it should be removed.

It is not the pressure of the bone in every instance that causes the reflex disturbance, for the brain will sometimes become accustomed to this pressure, if not too great, and its functions go on as before, after recovering from the shock of the accident, but if the membranes have been lacerated at the time, or sustained some other injury, followed by a circumscribed meningitis, a cicatrix will form, possibly adhesions and some contraction take place, the cortical substance will be irritated, and from this cause convulsions are liable to ensue, or circumscribed inflammation may extend to the brain and abscess result, or a spicula of bone may be driven

into the cerebrum and its presence excite the disease; therefore, these sources of irritation should always be looked for and removed. Mr. Horsley thinks that after a button is removed, if it is noticed that the dura mater bulges through the opening, it is an indication of the existence of pathological intercranial tension.

I believe, in all cases of epilepsy caused by depression from an accident, a contracted cicatrix of the scalp, or a sensitive spot in the head (as in a case that came under my observation some years ago, which, by pressure upon a sensitive spot, would produce convulsions), trephining is not only justifiable, but demanded, and should be done without hesitation. If the bone is thickened, Professor Briggs'* teaching is correct—remove it; trephine a second and a third time, if need be, taking away all of the diseased bone, or even though it be not diseased, if there is much unnatural thickness, remove it, and if any pathological condition of the membranes or the cerebrum be found, it should without hesitation be carefully cut away, leaving only healthy tissue, especially as regards the cortical substance, and no tense, thick cicatrix of the *membranes should be allowed* to remain. Even thick, sensitive cicatrixes of the scalp, in my opinion, should be removed, if there be the slightest suspicion that the epilepsy is caused by the traumatism.

After these operations the healing is materially assisted, and subsequent danger lessened, by dissecting up the scalp for a few lines around the wound in the skull before it is brought together, in order not to have too much tension by cicatricial contraction. The wound should be carefully dressed by the antiseptic method and watched, every source of supposed irritation removed, and, if possible, made to heal by first intention, to prevent an extensive scar. The general health, should be looked after, secretive functions kept active, and the nervous system tranquilized, the patient kept quiet and cheerful, away from all sources of excitement and from everything that would in any way affect the general health

*International Encyclopædia of Surgery.

for several weeks after recovery seems complete. In my judgment, much of the success in many cases depends upon the proper attention to careful and judicious after-treatment.

In long standing cases improvement in the convulsions dose not always begin at once; sometimes several months elapse before the improvement is marked and the habit gradually broken up, for there is a good deal in the habit the brain sometimes gets into with regard to these convulsions. Many neurologists now think that "idiopathic epilepsy has its origin in the cortex of the cerebrum, and from a surgical standpoint it is, therefore, not difficult to understand that any chronic endo-cranial lesion which affects this part of the brain can produce epilepsy." Dr. Senn,* of Milwakee, in his investigations, recognizes as causes of reflex epilepsy affections or wounds of the peripheral nerves, which indirectly affect the cortex of the brain, as well as lesions of the cortex itself.

It sometimes occurs that in trephining the skull for injuries or disease the surgeon is not careful enough in his explorations of the wound, and fails to remove splinters of bone or other foreign substance, which is liable to cause an inflammatory condition, and may produce epilepsy among other troubles.

Is it too much to hope that surgery may yet come to the aid of many epileptics who are otherwise considered incurable and doomed to a life of untold misery, whether the trouble be of traumatic origin or not?

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REPORT OF A CASE OF ANEURISM OF THE ASCENDING AORTA, INVOLVING THE INNOMINATE SECONDARILY,

Operated Upon by Simultaneous Ligation of the Common Carotid and Subclavian Arteries—Cured.

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October 24, 1888.—Found patient, Mrs. P., aged 37 years, married, multipara, last child about three years of age. No history of syphilis as far back as third generation. The patient's two aunts, two uncles and grandmother on her mother's side, had died suddenly from heart lesion, but she did not know exact trouble. Her father had died from acute tuberculosis. Patient had had a slight cough for some time and for last few weeks had suffered from asthma at night. For past six or eight months had been much annoyed by a buzzing and humming in her right ear, and for past few weeks had noticed a stiffness and some tenderness in right cervical region. Had had more or less pain in upper thorax for a year or more, but on Friday, (October 19, 1888,) upon walking up a steep hill, had felt something give way and was seized with a sharp pain in chest, just over the third left costo-sternal articulation. Felt some shortness of breath, and after reaching home found that upon moving around or getting up she felt sick and heart palpitated. Having suffered

from more or less palpitation of heart before, especially during her work (her occupation being to run a loom in a cotton mill), she paid but little attention to it, but it increasing and pain not subsiding she sent for me. Upon inspection in dorsal position, a slight pulsation visible at root of neck, just above the sternum. Upon sitting the pulsation disappeared and could not be seen anywhere. Palpitation revealed a thrill and pulsation over upper portion of thorax, most distinct in second right costal interspace, but felt over a space of three and a half or four inches in diameter, and transmitted a short distance along the subclavian and carotid upon right side, Percussion gave slight dullness over upper part of sternum over a space of two inches in diameter, and extending from about one inch below the superior extremity of the sternum. Slight tenderness over this space but no softening; auscultation gave a well marked aneurismal bruit to be heard with the greatest distinctness in second right costal interspace close to sternum, but heard quite distinctly along the subclavian and carotids. Radial pulse not impaired, being apparently synchronous, some little laryngeal irritation. Pupil of right eye slightly contracted, and some little dimness of sight on that side. Drummond's sign of a systolic puffing upon stethoscopic auscultation over trachea proved of no value in this case. An apparent puffing was noted, but upon careful examination was found to be produced by the obscuring of the tracheal respiration by the loud bruit, thus giving an intermittency in respiration. It is possible, however, that in a large aneurism, and in a different position, more or less stenosis of the trachea might be produced, and in that way give rise to an apparent puffing. Diagnosed aneurism of the ascending portion of the aorta. Put her upon pot. iodide and tr. digitalis, the action of the heart being tumultuous and irregular. Limited her diet and tried to follow Tüfnell's method. Upon October 28, sent her to Mission Hospital. Upon more careful auscultation, a mitral regurgitant and aortic stenotic murmur was heard, the first being transmitted

over area common to aortic stenosis, there being a slight doubt as to differentiation between this murmur and the transmitted aneurismal bruit.

Upon October 29 she spat some blood, but it was probably from a laryngeal or tracheal irritation. Commenced to complain of pain in back, deafness in right ear, and slight pain and difficulty in swallowing. The pulsation now is quite apparent at root of the neck, and can be felt along the carotids and subclavian for some distance. The action of the heart is regular now and she has suffered from no palpitation, but has had several attacks of asthma. The right pupil is contracted and the radial pulse upon the right side is getting a little weak and is a little later than the left. Unfortunately no sphymograph was convenient and so exactness could not be obtained. Tracings would have been of interest in this case.

Upon November 2, finding the aneurism apparently growing, not at all affected by the iodide of potassium and dieting, I decided upon operation. By the way, I think many cases of cures by the iodide treatment are so many cases of mistaken diagnosis, many being reported as aneurisms the size of a walnut, pigeon's egg, etc. I imagine it would be very hard to diagnose such an aneurism, it not being likely that one of such small size would produce symptoms directing the attention of the patient to the aorta.

At the time of operation there was a dullness over some 3½ inches of diameter not well marked except over sternum. The radial pulse was quite perceptibly affected and involvment of the innominate artery was probable. Upon November 3, I operated at Mission Hospital, in this city, assisted by the staff. Chloroform was given, but she took it so badly, failure of respiration repeatedly recurring, that I substituted ether. I intended to tie the common carotid just above the omo-hyoid, but it being placed higher in the neck than usual, I came upon the carotid nearly half an inch below where it crosses. The vessel was exposed by drawing the sterno-mastoid outwardly and the sterno-hyoid inwardly, thus ex-

posing the artery nicely. The descendens noni was just upon the artery, but was held aside while the ligature was passed from within out. The internal jugular was not seen. Catgut was used to ligate. The subclavian was tied in the third portion, just outside of the scalenus anticus. It was placed quite deep in its bed here and had to be raised some little distance before the ligature could be tied. The external jugular vein and a net-work of small veins crossed the middle of the incision, but by careful working none were cut. The jugular I dissected out and drew to the inner side of the incision. The brachial plexus was not seen, nor was anything of importance except the artery. No blood was lost during the operation, the water hardly being discolored. The incisions were closed with very light catgut and iodoform and iodoform gauze used as a dressing. Antisepsis was strictly observed. Time of operation, one hour and a half.

Patient rallied well from operation, but suffered great nausea during the night. At 9 a. m. on November 4, the patient was easy; no pain but a slight heaviness in right arm, circulation good and well established, pulse in left arm a little increased, a distinct pulsation to be felt over abdominal aorta upon palpitation. Pulse 100. Temperature normal. On November 5, some appetite and feeling comfortable. There was no rise of temperature during the entire period, and the pulse upon the third day went down to 80. Upon the fourth day after operation a small abscess formed at the root of the lower right canine tooth and ruptured, the tooth being decayed. Not a bad symptom appeared, no sign of aneurism, the only thing complained of being a little weakness in the right arm. All the subjective symptoms present before the operation had disappeared. The dressing was taken off on November 13, the tenth day, and everything found united. No sign of pus, the dressing not even being stained. The pulsation had diminished somewhat, and from this time on got less and less. The patient got out of bed on the twelfth day, and left the hospital on the seventeenth day after the operation. I put her on a syrup of the hypophosphites, and

she gained strength daily. Upon the twenty-second day of November, nineteen days after the operation, the pulsation could hardly be felt, and then only by deep and firm digital pressure upon the supra-sternal fossa. No thrill present upon the thirtieth day of November, the twenty-seventh day after the operation no pulsation could be felt, but a slight systolic bruit could be still heard over the ascending aorta, being confused and lost in the aortic stenotic murmur. The abdominal pulsation had disappeared, and the only thing abnormal was a slight increase in the pulsation of the left carotid, there being a compensatory hypertrophy and dilation. Discharged as cured with directions to report every month or two, or upon anything abnormal happening.

The statistics of this operation are in some confusion, owing to several divisions made by different writers upon this subject. J. A. Wyeth, of New York, claims to be the second to operate upon aneurism of the ascending aorta, this then being the third case of its kind, the first dying; Wyeth's, reported as a cure, dying in one year from diarrhœa, and my case, also a cure, being the second case. Gross, however, gives six cases, beginning with Bickersteth, in 1864, and ending with Palmer, in 1880, which, added to Wyeth's and the present case, make eight cases. For lack of time I have not collected statistics upon the operation, and will be thankful for any help in this direction which any member may give me.

This operation is practically in its infancy, the great mortality being due to delay in operation. So it has been with all operations, the results getting better as we operate earlier, it being, I think, a justifiable and practicable procedure. Very few patients are willing to go to bed for two or three years, conceding that the iodide of potash treatment is of service, and if taken in time hopes may be given of a cure, with but little risk, by this operation. It should not be undertaken by one faulty in his anatomy or in his surgery, and antisepsis must be thoroughly carried out.

A CASE OF CUT THROAT.

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On the twenty-ninth day of October, 1888, Robert Watson, about twenty-four years of age, under an insane impulse, cut his throat with a dull pocket-knife. The wound was made transversely through the thyro-hyoid membrane, separating the larynx from the base of the tongue and opening the pharynx. The depressor muscles of the hyoid bone, the sterno-hyoid, the thyro-hyoid and the omo-hyoid, I think, were all severed. The larynx and trachea dropped down, leaving a gaping wound five inches long and two inches wide. The carotid arteries could be seen plainly pulsating in either angle of the wound. The larynx and trachea thus set free from attachment above, and acted on by the sterno-thyroid muscles, projected forward and afforded a beautiful view of the inside of the vocal box in the living subject. The finger passed through the wound, readily entered the pharynx and fauces, or passed through the mouth and around the base of the tongue, if long enough, would have come out at the wound. Water taken into the mouth all ran out of the wound. All power of deglutition was lost. The wound was inflicted in Tishomingo county, Mississippi, at a saw-mill ten miles south of Iuka. I was called to see the patient with Drs. R. S. and W. A. Hodges, and arrived there, over forty

miles, about twenty hours after the occurrence. At that time all hemorrhage had ceased; it had been quite free but not excessive. The patient was resting very quietly and breathing very easy through the yawning wound. Pulse fairly good and mind apparently entirely clear. The patient is a young man of exemplary character, exceptionally good morals, well educated, a Methodist minister, and son of the proprietor of the mill. Coaptation of the wounded structures in the deeper parts of the wound was impracticable, but we drew the skin and fascia together and closed the external wound with eight or ten silk stitches. The edges of the wound came together so accurately that the line was scarcely visible, and neither blood, mucous, nor air escaped through it. Breathing through the nose and mouth was perfectly free and easy—entirely normal. I hoped for healing of the external wound by first intention, and I believe it would have occurred if the head could have been kept bent forward. But we were compelled to support him by means of the stomach tube, the frequent introduction of which caused the stitches to yield so that air and mucous passed between the edges of wound. To introduce the tube it was necessary to tilt the head strongly backward, and the finger in the fauces to guide the tube caused efforts to vomit. Notwithstanding all this there was but little leakage for four or five days. But after that time, slight suppuration along the suture tracts caused them to yield and the wound began to gape and some of the stitches cut through. We removed the balance as they were doing no good. The wound had closed only for a short distance in each angle. We attempted to approximate the lips of the wound with plasters, but the beard and the sharp angle under the jaw interfered with the adhesion of the plasters, and the frequent bending of the neck back to introduce the stomach tube made them very inefficient. Healthy granulations appeared on all the wounded surfaces, and the patient got along much better than we expected. He took one pint of milk with an egg and a little sugar beat up in it twice a day, through the stomach tube. He rested well most

of the time. A few times he manifested some mental aberration, but chloral and bromide of potassium by enema acted admirably. This, with a few hypodermic doses of morphine, and some laxative enemata, constituted all the medication required. He desired to recover and coöperated cheerfully in everything done for him. He became very tired of the stomach tube and Dr. W. A. Hodges, who had the immediate charge of the case, tried nutritive enemata, but after five days it was deemed best to return to the stomach tube. The egg being a little heavy on the stomach was left off, and he got along very well on one and a half pints of milk twice a day. He retained his strength and did not emaciate perceptibly. Just one month after the injury was done he recovered the power of swallowing liquids, and now (December 4) the opening in the larynx is less than a quarter of an inch in diameter and the external wound less than one and a half inches. He is all the time hungry and is gaining strength every day. The simple water dressing at first and a little cosmoline or cerate afterwards kept the wound in as fine condition as could be. There was scarcely any suppuration at any time. No antiseptics whatever were used. There was no cough, or other symptom indicating laryngitis or bronchitis.

NOTE.—May 20, 1889. The wound healed, leaving a fistulous opening about as large as the end of the little finger, through which air, water and food escaped. On the second day of May, 1889, I closed the fistula by a plastic operation, and it is now entirely well, and all the functions of the part fully restored.

FORCES PRESERVING CEREBRAL INTEGRITY,

With Report and Study of Cerebral, Meningeal and Sinal Lesions.

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In considering the mind, and in a study of mental action, it is, indeed, difficult to keep aloof from the theoretical and away from the speculative; to separate the entity—cerebrum from the functional—mind. It is more difficult to depart totally from the influence of the teachings of the fathers in physiology, and, in an honest way, tell one's opinions of cerebral action, from what he himself has seen. This is all that is hoped. There is no desire to demonstrate a new principle, but a hope to record certain clinical facts, which, in their interpretation, explanation and solution, may point to a different method of analysis and mode of study bearing on cerebral activity, exercise and pathology.

The cerebral cell draws nothing from the mind. So long as the cerebral cell or group of cells are in typical health, the mental action of the individual will be uniform, stable, normal. Disease that cell, or group, and the mind is deranged. The mind is totally dependent on the condition of the functionary cells. Resting the mind does but little or no good toward restoring the integrity of diseased cerebral tissue. In other words, the action of the mind has but slight influence

either to restore or degenerate cerebral substance. The mind is a function dependent wholly on the conditions of the cerebral substance, forming, indeed, a minor portion of its duties. The mental functions act only intermittently and temporarily. Some portions of the brain are without mental functions. There disease need not cause mental aberration.

What, then, is there to maintain the integrity of these centres? What the integrity of the brain?

The essential functions of the brain—as consciousness, will, moral act, imagination, reason, etc., are the factors claimed to preserve the integrity of the cerebral cells; that in the exercise of any one of these separate factors that there is such molecular vibration, as alone to exercise and preserve the cells. Is it rational to accept this theory? If this was the true solution, then there are three requisites, viz.:

First—That each and every cell or centre be controlled by and have mental function; which is not true.

Secondly—That the mental function must precede the development of the cells, and by its inherent force call forth the cell; which is not the case.

Thirdly—That use or disuse of these functions would regulate the grade of development of the cell; which we do not find.

If these essential functions maintain the integrity of the brain, it would appear that they must develop, before or simultaneously with it; but on the contrary, we see the most typically healthy brain, spring well grown into action—the most developed part of the new born, having never before exercised one of these essential functions. It is evident, therefore, that these essential functions had nothing to do with the anti-natal growth and development of the brain; but that other causes effected this growth. Is it reasonable to contend that certain causes developed the brain of the fœtus, and that at its birth these were suddenly suspended and other, yet totally different causes, were substituted? That this new agent regulates its growth, development and force, and that its exercise is completely changed? Is it not

far more likely that the same causes which grew the fœtal brain act after birth, for further growth and development? It is conceded further, that this cerebral growth and development in the fœtus is the result of the quantity and quality of the blood directed to the brain by the anatomical arrangement of the vessels. To the volume and purity of this blood current its development is due. This kneadation and nutrition is the developing and preserving function of the fœtal brain.

How with the adult? Just the same. It is claimed that one-fifth of all the blood goes to the adult head and brain. In the study of this question, in the adult there are interesting observations to take into consideration.

I. Mobility of the Encephalon in the Cranial Vault.

The normal cranial vault is far from full of cerebral substance. The brain has upward, downward, anterior and posterior motions. The encephalon is not fixed, but at each systole of the heart is raised on the volume of the blood current, compressed against the inner table of the vault of the cranium, causing the blood filling the sinuses at the vertex to flow to those at the base. These sinuses having been compressed, stand, consequently, empty to receive the blood from vertex. As the arterial blood passes through the circle of Willis, (the brain is elevated), then into the small vessels, the brain is expanded, the arterial force being removed from below the brain, at the same time sinks down, compressing the now distended sinuses at the base, forcing the blood into the vessels of the neck and thorax. In other words, the systole and dyastole of the heart causes a corresponding systole and dyastole in the brain. The brain is thus kneaded at each heart action. This kneadation is further aided by the cerebro-spinal fluid, which aids in equalizing pressure. This motion is constantly seen through the windowed skull at the fontanells and in wounds of the vessels (venous) of the neck.

Operations on the brain for epilepsy show how the brain can-retreat from the instrument. Sir Wm. McEwen, of Edinburgh, speaking of anchored encephalons, says: "It has no longer the free play within its watery bed to expand and contract according to the varying state of the circulation."

II. THE VASCULARITY OF THE CEREBRAL SUBSTANCE.

The cerebral substance is not so vascular as was formerly judged, and never have I noted fatal hemorrhage occurring from wounds of the brain alone, uncomplicated by wounds of large vessels or sinus. Shot wounds of the brain rarely bleed or ooze alarmingly. Probatory exploration of the brain yield no bad results from bleeding. Wound of the vertex complicating fractured skull seldom frighten us with hemorrhage. In the evacuation of cerebral abscesses, troubled hemorrhage is the exception.

From what has been said already, taken with the anatomical arrangements of the arteries at the base of the brain, the distribution of the venous sinuses, and the location of the plexuses, together with the pressure and action of the cerebro-spinal fluid, we judge these anatomical peculiarities are arranged for a purpose, and that purpose appears to be the kneadation and the mechanical exercise of the brain.

The following cases, which have appeared in Southern medical journals, go far toward bearing out these principles:

CASE I.

COMPOUND COMMINUTED FRACTURE OF FRONTAL BONE AND BONES OF FACE, WITH DIVISION OF SUPERIOR LONGITUDINAL VENOUS SINUS—SEPTIC MENINGITIS WITH ŒDEMA —DEATH.

William Howard, admitted October 27, 1888; negro man, aged 26 years, in excellent general health, was boasting of having carressed sexually a Caucasian woman, when he was struck a violent blow with what is supposed to have been the four-pound iron mall used to drive spikes in the railroad ties.

The blow, directed downward and to the left, impinged on the hairy scalp, one and one-half inches from the border line of forehead and three-quarters of an inch to right of median line. So forcible was the blow that the tissues to the bone were divided, cleanly cut. The mall struck the skull three-quarters of an inch to right of median line and one inch above the frontal eminence, one inch and a quarter from suture with parietal bone. The entire frontal bone was torn away to within one inch of the external angular process on either side. The internal three-quarter circumference of either orbit was removed, together with the nasal eminence and inner half of both superciliary ridges, and the internal half of right and inner third of left frontal eminence and frontal crests. Of the orbito-nasal portion of the frontal bone it is sufficient to exhibit the entire vault of either orbit, and state that the right lachrymal gland was dislocated from its fossa. The right bulb was ruptured and the media escaped; right optic nerve and muscles of right orbit lacerated; the right ophthalmic vein was twisted and lacerated; the ethmoidal notch, together with the crista gallia and cribriform plate of the ethmoid were removed. The end of the mall passed on, fracturing the ethmoid, both nasals, both turbinated and both superior maxillæ, and the vomer. The right-superior maxilla was dislocated downward by one-half to three-quarters of an inch.

Being called to such an injury one looks for the points of emergical danger. The right frontal bone was contused and lacerated, and the dura torn and the cerebral substance lacerated and escaping. On sponging this away I discovered a complete laceration of the superior longitudinal venous sinus and falx cerebri. The vein passing through the foramen cæcum was nowhere to be found. The superior longitudinal venous sinus was so traumatized and torn that it was twisted into a short cord, one inch back of the anterior margin of the frontal lobes. Bubbles of air passed up through the left orbit from the antrum of Highmore. The dura was separated from the skull for three inches from the nasal eminence

in every direction. The anterior margin of the anterior cerebral lobes was one and one-fifth inches from the nasal eminence. The anterior margin of the anterior cerebral lobes were nearly or quite at the sphenoidal fissure. On change of position the lobes would present at the wounds in the skull. The fragments were removed from the brain cavity, washed and cleansed, and the cavity plugged with a 26-inch bandage, soaked in 1–3500 of corrosive chloride solution. Skin approximated and sutured.

The progress of the case was remarkable, in that the temperature stood at 98 degrees in the forenoon and 99 degrees to 101 degrees at night. There was some muscular twitching on the second day, which subsided. The wounds of skin healed kindly, and the packing was removed on third day. After removal of this all went wrong. The brain soon became congested, and death rapidly supervened from inflammation at the base of the brain.

Death again was hard to combat, for the reason that drainage could not be secured without the entire withdrawal of the cerebro-spinal fluid, and where such a quantity of this escaped a fatal œdema was induced. Further, too, the wounds of the face were sufficient to cause a fatal termination. Life being continued to the fourth day I regard as a successful treatment, for the patient was for three days thoroughly rational; was able to make a legal statement of facts, a confession and have administered the last sacraments —all of which was gained by this delay of death. Dr. A. T. Henley was with me in this case.

Noteworthy Points:

I. *The Mobility of the Brain in the Cranial Cavity.*—The position of the brain in the skull as the patient lay in the dorsal decubitus, the anterior margin of the anterior lobes of the brain rested two-fifths of an inch in advance of the sphenoidal fissure, one inch from where we know it normally rests, and the brain was without pulsation. On a change of position, the patient resting on the face and abdomen, the brain

presented at the window in the frontal bone. From these measurements it appears that the brain is capable of decided motion within the cavity of the skull, having anterior posterior motion of three-quarters of an inch. The readiness of this motion is decidedly increased from the normal by loss of the cerebral fluid, which acts as a prop, and prevents the excessive free motion of the brain in health.

II. Note the *lack of fatal hemorrhage* from the wound of the superior longitudinal sinus, laceration of the falx cerebri, probable rupture of the inferior longitudinal venous sinus and rupture of the right ophthalmic vein. Such wounds one would judge rather fatal from various causes—(*a*) air embolism; (*b*) hemorrhage, etc.

Theory only frightens the surgeon in regard to the embolism of air. Notwithstanding it happened to Volkmann in the removal of a sarcoma from the vertex of the skull, yet this must be a theoretical danger, as it is difficult for air to descend along the course of the longitudinal venous sinus to the torcular herophilii, no matter what the position of the patient. This danger I would consider slight as compared with that of the fatality from hemorrhage from wound of sinuses. Yet this mortality from hemorrhage is not so great as one would expect. As in this case we see simply the traumatism of the blow that divided the sinus, so twisted it that the hemorrhage was checked. I only packed around the divided and twisted end a snug gauze dressing; nor was there a recurrence of the bleeding. Indeed, one reads of complete division of the superior longitudinal sinus, while the suturing of the ends with fine thread in cases of tumors of the cerebrum, without fatal issue (Bergmann), and the packing of the cavity and compressing the sinus in a number of cases.

Division of the sinuses near the anterior extremity is of less danger than at their posterior extremities. These dangers are in three forms, viz.:

(*a*) Dangers from air embolisms increased.

(*b*) Increased dangers from profuse hemorrhages.

(*c*) Dangers increased from cerebral œdema.

It appears, however, that a sinus may be divided at any point of its course without fear of fatal œdema, though that is always on element of danger; but the division of two renders such dangers a maximum if not necessarily fatal from this cause. (Shellmann.)

[Dr. Wm. A. Hume, of New York, in *Record* of February 16, 1889, reports a similar case, where hemorrhage from the superior longitudinal sinus stopped spontaneously.]

CASE II.

COMPOUND COMMINUTED FRACTURE OF THE SKULL, WITH DEPRESSION—RECOVERY.

November 26, 1886, was called to Leonidas Whistle, a negro boy, aged 16 years, who, while trying to check a runaway horse, was knocked down by the breast of the animal, which, in its fright, tried to leap him. The boy was thrown several yards up the street on the furnace slag, striking with great violence, which was increased by the weight of the horse, which alighted with both feet on the boy's head and throat, inflicting the following injuries:

The calk of one shoe struck the scalp near the center of the left parietal bone, dividing the tissues to the skull, passing forward toward the median line, across the coronal and frontal sutures to a point a little to the left of the right frontal eminence, at which point it entered the skull, causing a compound comminuted fracture, with depression of the frontal bone one and a quarter inches square. The central fragment, one inch square, was dislocated under the edge of the unbroken shelving bone, between it and the dura mater, toward the external orbital ridges. There were four other fragments depressed, making compression on the dura mater and brain, the dura mater being untorn. The other calk of the same foot made an inch lacerated wound in the left cheek. The other foot struck the chin and larynx—the chin wound, one inch deep, passing under the maxillary symphisis toward the

floor of the mouth. A second wound compressed the cartilages of the larynx, tearing the cuticle of the neck three inches, starting from the median line at the upper border of the hyoid bone, passing toward the right ear, parallel to the lower border of the inferior maxilla, causing great tumefaction and considerable oozing. In the right occipital region there was a large sub-aponeurotic cephalematoma, two or three inches in diameter. When seen first, patient lay in a condition of coma, on left side, with extreme flexure of all the members and marked difficulty of breathing. Pupils normal. No other symptoms, excepting profuse scalp hemorrhage.

Boy conveyed home. Scalp, neck and face thorougly cleansed and shaven at the hands of Dr. Brice M. Hughes and myself; irrigated with bichloride solution and carbolized water. Patient anesthetized. Scalp wound enlarged toward the external orbital ridge. Dr. Hughes, with the Pean hemastatic forceps—which is as good a grasping forceps as I know of for light work—removed, after some difficulty, the central displaced fragment. The remaining four fragments I was enabled to remove without the use of any other instrument than my fingers and strong forceps. These five constituted the comminution. The cerebral substance of right frontal lobe was considerably lacerated, as could be felt through the unbroken dura mater which bulged through the aperture from blood beneath it, due to hemorrhage from the brain and meninges. This membrane was not incised and the blood evacuated, but was permitted to remain as it was. The bones of the skull were smoothed, and all irritations removed. Wound thoroughly cleaned and dried, edges of scalp pared and approximated, sutured with a small antiseptic silk, no point of drainage being preserved, the attempt being made to convert it into a simple fracture by securing primary union. Wound thickly dusted with amorphus boracic acid, and a thick permanent bichloride dressing applied. Wounds on face, chin and neck treated on same plan.

Progress of Case.

Recovery was rapid and complete. Primary union of scalp, with ready absorption of subdural clot and cicatrization of other wounds without pus. On the sixteenth day he was discharged, and since then he enjoys good health in every way.

Noteworthy Points.

(*a.*) The rapidity of the union of the scalp appears due to the antiseptic precautions, together with the paring of the edges and application of the permanent corrosive chloride dressing.

(*b.*) The conversion of the fracture into a simple fracture by gaining immediate union was a point gained, as it rendered the skull less liable to caries and necrosis, as it freed it from such irritants as pus, air, etc., and lessened the dangers of meningeal complications.

(*c.*) We feared no compression from the hemorrhage beneath the dura mater, as this seemed to be checked, and there was ample room for bulging through the trephined hole. Note again the preservation of the dura mater, even though there existed a large blood accumulation beneath it. I preserved it to prevent suppuration in the blood clot and cerebral substance, for notwithstanding Sir Prescott Hewitt says: "In every case of contused bone in which I have found inflammation on the outside surface of the dura mater, I have also found inflammation on the free surface of the arachnoid," yet this inflammation may differ in kind. It may be a suppurative inflammation between the bone and dura mater, and yet this membrane so shields the parts that we find but plastic lymph on the arachnoid. Thus the great service rendered by this membrane in suppurative inflammation between the skull and dura mater was shown by Mr. Pott, who relieved three out of five of these cases by bold, early operation. Lately surgeons have failed to attain these good results; but this is not due to any failure of the dura mater to limit suppuration for a time, but to delay the operation, the membrane

undergoing dissolution being bathed in accumulated pus. We were justified in expecting some suppuration from the contused bone, and this bone being in communication with the air.

(*d.*) What became of the remaining blood clot beneath the dura mater?

I suspect the absorption of its watery portion due in part to the withdrawal of all fluids from the patient, but principally to its dilution by cerebral fluid, which prevented coagulation, together with the throbbing action of the brain, which, constantly needing it, promoted its absorption. The solids molded themselves to the parts and became a thin organized membrane, doing no damage.

Dr. Charles B. Nancrede, speaking of these sub-dural clots, says: "After the disk has been removed the dura mater bulges into the opening, is of a bluish appearance, and is devoid of pulsation. The membrane should then be incised to give free vent to the effused blood." But these occur in cases where there is marked depression from the clot, and not in cases similar to the one here reported, where there is no compression and the blood not an irritant.

(*e.*) I regret that I did not make an effort to replace the fragments and so fill out the window, after the method of Sir Wm. McEwen; but at that time this method was not known.

Case III.

Compound Fracture of Skull, with Depression—Six Years Later Epilepsy, Due to Cyst and Anchorage of the Brain—Trephining.

Mr. D., aet 24 years. In this case the notable points are that the operation was done without an anæsthetic, with the patient in an upright position. To see the action of the brain, as the patient suffered shock, was an interesting phenomenon. At one moment it would protrude through or present forcibly against the windowed skull, and at another it would retreat more than half an inch from the inner tables.

At such times I thought he was to be seized with a paroxysm. I assisted in the operation. The surgeon feared or declined to give an anæsthetic.

CASE IV.

GUN-SHOT WOUNDS OF BRAIN.

I only wish to report the case of Mr. L., aet. 36, who received two pistol-shot wounds of the upper portion of either cerebral hemispheres. With this injury he survived seventy-eight hours, during which time the loss of blood, or watery oozing, was practically *nil.* Post-mortem showed great laceration of cerebral tissue.

CASE V.

IRON ROD THRUST OF TEMPORAL LOBE.

This was a through and through thrust with a coal poker. The cerebral substance was extremely damaged. The rod was retained in the wound a few minutes before it was withdrawn. Notable lack of bleeding.

CASE VI.

COMPOUND COMMINUTED FRACTURE OF FRONTAL BONE—LOSS OF CEREBRAL SUBSTANCE—RECOVERY.

P., negro, aet. 5 years. There was loss of more than a drachm of brain substance, accompanied and followed by little or no bleeding. Fragments of bone removed attended with suppuration, and followed by complete recovery. Other than the suppuration it was similar to Case II.

CASE VII.

TWO GUN-SHOT WOUNDS OF BRAIN.

J., aet. 23. This case has nothing more than is told in Case IV, unless there was even less oozing and a greater escape of cerebral substance.

In offering these records, I trust you may all understand me; for, being unsatisfied with the theory that "molecular vibration," due to mental action, was the force which developed and preserved the brain, I turned elsewhere for its solution, and think that in the mechanical forces we find enough to account for its growth and development aside from mental causes. Many arguments might be brought forward in further support of these facts, but in so short space I needs must defer them.

ELECTROLYSIS IN MORBID ALTERATIONS THAT ARE PRODUCED IN THE PROSTATE BY GONORRHŒA OF THE URETHRA.

By John D. S. Davis, M. D.,

Birmingham, Ala.

The structure of the prostate gland consists in greater part of muscular substance, tubular glands and glandular tissue.

Like the follicles of the fossa navicularis, the excretory ducts of the prostate gland are ever liable to become diseased through the propagation of a gonorrhœal discharge to the deeper parts of the urethra, giving rise to a sero-muco-purulent catarrh.

The prostate often is enlarged and often suppurates, the pus tunneling its way into the rectum, urethra or perineum.

The muscular structure of the prostate suffers no pathological alteration; it is in a constant state of contraction, expelling the secretion, and causing tenesmus of the neck of the bladder and anus.

Owing to the capillary engorgement which takes place in the prostate and urethra, the patient is troubled with dripping of the urine at the end of each act of micturition.

Patients suffering with gonorrhœal serous or mucous catarrh of the prostate, are generally troubled on the one hand with difficulty in defecation, and, on the other, from a constant desire to urinate.

So long as the œdematous swelling of the prostate is not very intense, the pus corpuscles, originating in the *cryptæ*, become mixed with the normal secretion of the gland, and form with it a gluey, yellowish-green fluid to be thrown off through the urethra, electricity, properly applied, will restore the organ to health, and relieve it of a disease that never goes away of itself.

By mild, negative galvanic currents, we have a practical, painless, harmless and convenient means of treating this form of disease.

In cases where the œdematous swelling of the prostate is very tense, even to the complete closing of the urinary track, electricity will often offer the best and simplest route to complete recovery. In cases where there is progressive suppuration, with the cavities of the gland filled with pus and much dilated, galvanic stimulation with varying dosage and polar action, even in such cases of extensive suppuration, will prevent the glandular spaces from coalescing, correcting to a very large extent the perversion of nutrition. Whether it be a question of hypertrophy or suppuration, the current will be, in experienced hands, a stimulus of the first order, which will tend to reëstablish the equilibrium or normal function of the gland.

In cases where there is progressive suppuration with effusion of pus into surrounding tissue, I always make a free incision with the knife through the perineum into the prostate gland to secure drainage. With a staff in the urethra for a guide, I proceed as in an operation of external urethrotomy, extending the incision to and through the prostate gland. This class of cases which, primarily originates from the propagation of the acute purulent urethral gonorrhœa to the prostate gland, and a condition often aggravated from injuries of the prostate by the introduction of catheters, bougies and impaction of calculi, already suppurated, will, after a thorough evacuation of the pus and washing out the cavity, under galvanic stimulation, rapidly return to its natural size and regain its normal function.

Having long followed the teaching of Newman in the treatment of urethral stricture by electricity with good results, I began this method for prostatic troubles, and prepared myself for the investigation of a treatment, the efficacy of which had been much doubted. The following three cases of thirty-seven treated at my office, will suffice to illustrate the efficacy of the treatment herein advocated. In every case care was taken to observe every successful point ascribable to the treatment.

CASE I.

Y. C., locomotive engineer by occupation; twenty-seven years of age, good general health, and temperate. Had gonorrhœa six months previous to the time (July 10, 1887), the patient presented himself to me for treatment of enlarged prostate.

He had a constant desire to urinate; difficulty in defecation and considerable burning pain in the urethra. The urethra was smooth, and admitted a number 32 French *bougie à boule* to the prostate where it was obstructed. I succeeded in passing a *bougie à boule* number 5, French, to the prostatic urethra. The anterior wall of the rectum was bulged out by a painful tumor, urine alkiline, specific gravity 1025, containing pus.

Newman's insulated olivary bougie, number 5, French, passed into the prostatic urethra. Current five milliampéres passed through bougie, connected by cathode for fifteen minutes. The patient was sent to bed for three days.

July 13.—Slight pain after urinating, Number 10 *bougie à boule* was passed and engaged in prostatic urethra. The negative current, five milliampéres, was again passed for fifteen minutes. No pain was produced, and no unpleasant symptom followed either application.

July 16.—The prostate gland was much smaller, the stricture allowing the easy passage of a bougie number 21, French. In like manner the negative current was used for fifteen minutes. The patient was so much improved that he left and

did not appear for treatment again. He took his engine out on the road, July 18. He experienced no difficulty in urinating after the 13th of July.

The gleety discharge ceased on July 15, and has not since reappeared. Last examination, September 30, 1880, showed prostate gland almost normal in size, and prostatic urethra admitted a bougie number 32, French.

CASE II.

June 1, 1888, W. B., tobacco merchant, aged twenty-four years, white, good health and temperate. Had four attacks of gonorrhœa and been under the care of several surgeons for stricture and gleet. Had internal urethrotomy performed three times. The urethrometer showed numerous contractions from the fossa navicularis to depth of four and one-half inches. A *bougie à boule* number 7, French, could be passed to the prostate where it was arrested by a large tumor. The prostatic urethra would not admit the smallest instrument. The membranous urethra unusually granular, bleeding quite profusely on the passage of instruments—could not pass urine.

Aspirated the bladder, drawing off one pint and a half of alkaline urine; specific gravity 1027; containing pus with phosphates.

A number 7 bulbous bougie was passed to prostate, connected with the cathode, the anode placed over the abdomen; current five milliampéres, was used for five minutes when the current was increased to ten milliampéres and continued for ten minutes, when the bougie slipped through into the bladder. Patient was allowed to remain up and continue his business. Considerable scalding in micturition was experienced for two days.

June 3.—Number 14 bulbous bougie was successfully passed.

June 6, 9, 12 and 14.—Numbers 16, 18, 30 and 32, were successfully passed. The gleety discharge subsided June 13, and had not returned.

Patient examined July 15, the urine slightly acid, specific gravity 1021, no pus. Passed a steel sound number 32, French, readily into the bladder, urine passed in a large stream and without difficulty. Last examination November 15, 1888.

CASE III.

July 9, 1888. D. F., drummer by profession, aged forty years, white, intemperate. He gave history of repeated attacks of gonorrhœa. He had just had a chill, and was in great agony; difficulty in defecation and inability to urinate. Very nervous, temperature 103, pulse 130 beats per minute. For six hours he had been frequenting the water-closet, straining every muscle and nerve to forcibly expel the urine and defecate. In his repeated acts of muscular contraction by inspiration, endeavoring to compress the bladder by the action of the diaphragm and the pressure of the abdominal wall, the prostate was elevated by the levator ani muscle, and compressed against the symphasis pubis, thus causing still greater compression of the urethra, which was already narrowed, and entirely prevented the flow of the urine.

The patient was placed on his back and a *bougie à boule*, number 5, French, was engaged in the prostatic stricture, connected with the cathode—current five milliampéres for seven minutes—when the urine shot out by the instrument, and the bougie passed rapidly into the bladder.

The urine was allowed to pass, and then the operation was continued for eight minutes longer.

The operation was repeated every third day for four times, when the patient was ordered out on a trip.

July 12.—Fever subsided immediately after first operation, the prostate gland began to diminish in size.

August 21.—The patient was examined, and the prostatic enlargement had almost subsided; no discharge, no pain, and a good, large round stream of urine passed without difficulty.

November 17, 1888.—The patient reported himself entirely well.

Thirty-four other cases (embracing six cases of fourteen urethral strictures,) have been consecutively subjected to this method of treatment.

In no instance has the pain been of sufficient severity to necessitate the subsequent use of anodynes.

The utmost delicacy in the manipulation has invariably been exercised, in order that the pain might be eliminated as far as possible.

The length of each *séance*, fifteen minutes.

The intervals between the sittings, usually three days.

Differing from the action of stricture of the urethra anterior to the membranous urethra, the gland begins to decrease in size and the calibre of the prostate urethra increases from the first application.

The œdematous swelling that follows two or three days after the use of electricity in stricture anterior to the membranous urethra, often causing passive obstruction, does not take place in the class of prostatic troubles reported in this paper. In urethral stricture the cicatricial tissue does not immediately begin to disappear, but the prostate gland (which is certainly more susceptible to the influence of low currents) begins at once to decrease and continues to complete recovery. The spasmodic action is allayed at once, softening taking place, and the absorbtive action begins immediately.

The results which have attended the application of electricity in my thirty-seven cases treated this way, gave me convincing proof of its merits. Supported by a very large experience in the use of electrolysis in strictures in every part of the urethral canal, I must repel any idea that electrolysis does not benefit spasmodic strictures of the urethra. Indeed, it is a fact, that the prostate receives the electric stimulation more kindly, and is benefited more effectually by the contemporary effect of the currents. In other parts of the urethral canal the posthumous effect of the current does the most good, while with strictures due to enlargement of the prostate, a contemporary and permanent benefit is the experience. In strictures anterior to the membranous

urethra an œdematous swelling follows the electrolysis, and, often, in two or three days produces a complete occlusion of the calibre of the urethra.

Owing to this fact electrolysis can be repeated every two or three days in prostatic troubles, while in urethral strictures elsewhere the surgeons must wait for the disappearance of the œdematous swelling due to the electrolytic effect.

Certainly it assures the patient a rapid and complete recovery. And how, I am unable to conclude, save theoretically.

Heat can only come into existence at the expense of some other energy. The chemical processes that proceed within the quiescent muscle to produce heat are augmented and increased by stimulation. The constituent albuminous bodies composing the muscular prostatic tissue, which cannot be separated by the ordinary method used in chemistry, unite during galvanic stimulation, setting free acids and alkalies (which act according to polarity on the living structure) to produce heat, softening of tissue, decomposition, relaxation and absorption.

The non-nitrogenous bodies, glycogen, fat, salts, acids and myosin unite during active stimulation by galvanism, forming lactic and carbonic acids and alkalies—a strong factor in the rapid degeneration and absorption of abnormal products.

The number of chemical modifications recurring at each electro-tissue-stimulation is always the same; but, when a greater stimulant is applied, a large amount of substances are consumed, so that both the production of warmth and decomposition may, through the stimulant, remain the same, according to the degree of tension and the stress of the living tissue. So long as the tissues are uninjured, the matter thus decomposed is carried away and fresh, nutritive, re-productive matter is brought to replace the decomposed or or expended material. The more abundantly the blood current flows through, the more rapidly and quickly are the products of decomposition removed and the earlier replaced. It is, therefore, very important to apply the

negative (moist) pole. For in the application of galvanic electricity to a living body, a perceptible dilation of the capillaries will result from the application of the cathode, and contraction on application of the anode. Catelectrolysis produces dilation of the capillaries and relaxation of muscular tissue while anelectrolysis produces contraction of muscular tissue.

If a muscle is continuously stimulated, it will be found that the contraction, though at first very considerable, soon decreases and finally entirely ceases to contract altogether. Muscular fibre when thus exhausted by the stimulating effects of the low galvanic current, may be induced to contract after rest, but it requires much time to recover from the exhaustion.

If the muscular tissue has been stimulated until disorganization takes place in the muscular fibres, it may be capable of again becoming active after a long interval of rest, but not until the products added exceed that which was expended. The change which occurs in the muscular tissue of the prostate from electrolysis deprives it of the capacity for contraction for a long time. The same thing happens if the blood-current ceases to pass through the tissues, or if prolonged stimulation induces too great a softening and decomposition of its non-nitrogenous bodies.

Apart from the enlarged condition of the prostate, there is always an accompanying spasmodic contraction of the muscular tissue of the gland (sphincter vesicæ externus) and a number of tubular glands, in addition to the glandular structure, which continues in a state of tetanus until relieved by an exhausting stimulant. Hence the efficacy of the contemporary effect of electrolysis.

To perform well any operation with galvanism, a good galvanometer is of paramount importance. The absence of a good galvanometer submits the physician to the "caprice of hazard," and "places him in the dilemma of making the operation too weak or too strong, without the means to control it."

Next to a good battery (which should have small cells), armed with a rheostat and reliable galvanometer, the intra-urethral electrode is of the greatest importance. The nickel-plated olive-shaped bulbs on slender, hard rubber rods of the proper length and curve, introduced by Newman, have no superior.

The cutaneous electrode should be applied to the abdomen or to any other part of the body that is not very susceptible to the current.

Never oil the urethral bougie or coat it with a non-conducting material before introducing it into the urethra, as we do other instruments, to facilitate their passage along the urethral canal. An electrode, so oiled, would be insulated and the current not able to pass properly into the structure of the prostate gland. Glycerine, being an available conductor, should always be used as a substitute for the common lubricants. In the absence of a good rheostat, the size of the cell of the battery used is of very great importance, for, if they are too large, the electrolytic action of the current will be so intensified as to become cauterizing, and thus harm may come to the patient's prostatic urethra. Cells holding one to two ounces of the fluid are large enough. According to the size of cells and elements (zinc and carbon), the action of the electrolysis can be regulated so as to produce simply a softening of tissue, decomposition and absorption.

After the introduction of the urethral sound, above all things, examine all the couples of the battery, to see that they are in correct working order, to avoid interruption of the current during the course of the operation.

Close the current on itself and make (in the absence of a good rheostat), each of the couples enter successively, cell by cell, one by one; the deviation of the compass will serve as a galvanoscope, and reveal at all times the integrity of the battery.

There is always a slight shock, even in giving the current cell by cell, to nervous persons, but, in the absence of a rheostat, by increasing cell by cell the shock is reduced to a mini-

mum, where, on the contrary, if administered two by two, three by three, the shock becomes two great by the transition, to the discomfort of the patient.

In order to obtain the maximum therapeutic effect of this treatment, the current must be minutely and carefully administered.

The cathode must be introduced into the prostatic urethra, and a very weak current passed through it, increasing little by little until the galvanometer registers the required number of milliampéres.

The method of electrolysis is simple and can be executed by the surgeon without assistance. It is painless, and requires no anæsthetic. No inconvenience is felt after the operation, and anodynes are never required; it is absolutely harmless; it is antiseptic, on account of the energy of the (even very low) current employed, and the electrolysis (called galvano-chemical absorption by Newman) is always followed by a process of retrogression, disintegration and absorption.

A contemporary focus of derivation is created in the diseased gland, analagous to what is done in a profound shock of the muscular system from over-exertion, or otherwise, which continues after the cessation of the current, transforming into posthumous effect, a slow and continuous action, the temporary shock which the passage of the current has transmitted to the muscular element of the prostate gland, and it finally inaugurates a process of retro-action, disintegration and absorption.

The time of *séance* may be double the time required in strictures anterior to the prostatic urethra. So long as the diseased gland is characterized by congestion and hypertrophy, gorged with secretions, and allows a considerable quantity of sero-muco-purulent fluid to escape by the urethra, electrolysis will restore it to its normal condition.

The muscular tissues are relaxed by the stimulating effect of the negative current; the vessels are relaxed and the blood flow is increased by diminishing the capillary resistance, and absorption readily takes place.

In the treatment of these cases I am often, for want of time, confronted with the proposition to increase the intensity and diminish the *séance* to render the same sum of electric outflow, and consequently equalize the therapeutic effects.

Physically speaking, a current of 55 milliampéres, during five minutes, is equal to a current of five milliampéres durfifty-five minutes, but the physiological and therapeutical action of these two amounts cannot be compared, on account of the varying energy of each current.

In the former a chemico-galvano-cauterization would result, and in the latter galvano-chemical absorption. It is my idea that these two terms should, for fear of confusion, be defined as follows:

Galvano-chemical absorption (electrolysis) is a chemical decomposition, which borrows its immediate effects from the separated non-nitrogenous bodies, which generate warmth, relaxation, softening and absorption.

Chemical galvano-cauterization is an absolute chemical cauterization, which, borrows its immediate effects from the acids and alkalies (the products of electrolysis), and acts essentially different in the fact, that the current of high intensity which traverses the body, (while in the same physiological manner the body furnishes the necessary elements for its own cauterization), extracts the acids and bases, which were latent, and held in combination, and brings them forth with the physical and therapeutic consequence of a cauterization that is thermic in appearance and result.

Electrolysis is inseparable from the application on the continuous current to living tissues, and should never have been substituted by galvano-chemical absorption. Absorption, as defined by Webster, is "the process or act of being made passively to disappear in some other substance through molecular or some other invisible means, as the absorption of light, heat and electricity."

This definition of absorption is used by Dr. Newman as a correct interpretation of electrolysis. Electrolysis means more, in the fact that its contemporary effect is to soften, de-

compose and separate the non-nitrogenous bodies of the abnormal tissue, in preparation for the posthumous effect, which is that of absorption.

As absorption does not mean all the functions of alimentation (mastication, deglutition, digestion, etc.), when applied to the power of nourishing, so it does not mean all the functions of electrolysis (heat, softening, disorganization, retrogression, etc.), when applied to the *materia medica* of this new treatment of strictures, prostatic hypertrophy, etc., by the galvanic current of low intensity.

"Electrolysis," says Apostoli, "is inseparable from every application of the continuous current to the human body, which contains substances especially capable of being decomposed and called electrolysis in the language of physics. It consists in the decomposition of matter, salt, etc.; it is the every-day experiment in the course of lectures on physics, of decomposing water in a voltametre, and in making oxygen and hydrogen gas separate each into a tube.

"But as the decomposition of salt sets free acids on one side and bases on the other (acids at the positive pole and bases at the negative), besides this first action, inseparably from the employment of the continued currents, and rightly called electrolysis, we have a second action which will be due to the setting free of the acids and bases, and to the respective cauterization which they produce upon the tissues in presence of which they may be, we shall have, in fact, a chemical galvano-cauterization, either positive or negative.

"The effect of electrolysis is, therefore, entirely analytical, and prepares for the subsequent caustic action, which is rather synthetical."

Electrolysis expresses the decomposing effects of electricity, which may exist, in a current of low intensity, without the final effect which results from a current of high intensity.

While electrolysis does not in any way prejudice the final effect produced by a galvanic current of high intensity (chemical galvano-cauterization, either positive or negative,) the

primary action of which it always is, it does prejudice the final or second action in a current of low intensity.

The galvanic current of low intensity will produce a decomposition of the tissues of the body, without resulting in or producing chemical galvano-cauterization of the superficial layers.

Electrolysis, while applicable to all strictures of the urethra, is of permanent benefit in many of the morbid alterations of the prostate.

It has an anesthetizing influence upon the terminal nerves of the point of application; it aids in overcoming spasmodic stricture of the prostatic urethra, in early relaxation of spasm by muscular exhaustion, following the continued over-stimulation; it seals the distention and relaxation by natural reproductive processes; it excites absorption and relieves the patient.

CYSTOSCOPIC EXPLORATION.

By A. V. G. Brokaw, M. D.,

St. Louis, Mo.

Mr. President and Gentlemen:

I wish to premise the following paper with my thanks for the honor you have conferred upon me by requesting me to contribute to your proceedings.

I purpose to consider some points and methods of cystoscopic exploration in the diagnosis of lesions of the bladder particularly, and incidentally of the ureters and kidneys. The perfection of the Nitze-Leiter cystoscope has made it possible to examine with a considerable degree of success the interior of the bladder, and has given us an aid in the diagnosis of obscure diseases of the bladder, ureters and kidneys which would without its use be impossible to diagnose with certainty. Certainly most excellent results have been attained by its use, though I agree with E. Hurry Fenwick that the cystoscope will not bear comparison in simplicity with the ophthalmoscope, laryngoscope or optoscope, but combined with epicystomy, as proposed by me, I think a more favorable comparison can be made, and probably an equality reached. Cystoscopy in certain cases is a valuable aid to diagnosis, prognosis and treatment, especially when the microscope, chemical analysis and the sound have failed, in such cases as hæmaturia of obscure origin, calculous affections, and also affording exact information as to the size,

number and character of growths within the bladder. Nitze describes fifteen cases of tumors within the bladder diagnosed by the cystoscope, and the exact information confirmed by operation, in nine of which cases rectal palpation, the sound and other means of diagnosis had given negative results. The instrument is valuable in cases of pus in the urine from obscure sources, tubercular affections of the bladder, etc., and, with the modification I wish to suggest, I firmly believe very great success will attend its use. From my own limited experience and the experience of those who are using the instrument, the fact that negative results and difficulties arise in practicing electro-cystoscopy, even with this ingenious instrument of Nitze-Leiter, leads me to believe that electro-cystoscopy combined with epicystotomy will open up a new and important field of surgery. One of the great difficulties in practicing cystoscopy is the presence of bloody mucous and pus, rendering it difficult to maintain a translucency of the fluid used in distending the bladder while the operator is making his examination, thereby seriously interfering with his view of the parts. To prevent this I would propose that under these circumstances an epicystotomy be performed and by means of a simple irrigating apparatus a constant current of clear water kept up within the viscus, thereby allowing of a thorough and uninterrupted examination. The cystoscope could then be introduced through a very small suprapubic opening or *per urethram*, and such method as suggested would permit of an accurate diagnosis and also treatment of local conditions, with a better chance of successful result than by any means heretofore adopted. Exploratory laparotomy is daily performed upon patients in cases of a doubtful nature. The danger of epicystotomy is hardly to be compared with that of opening the abdominal cavity. That the modern epicystotomy, or the Petersen-Guyon-Périer operation, is an operation easy of performance I am thoroughly convinced.

Let us consider briefly the *technique* of the operation: First, the preparation and attendance to the toilette. The urine should be, if possible, rendered acid, and the bowels

repeatedly and thoroughly washed out after the previous administration of a saline cathartic, as the presence of fæcal matter in any part of the lower bowel may have a tendency to push down the peritoneal fold in front of the bladder. The parts should be shaved and thoroughly scrubbed, securing absolute cleanliness; the hips slightly elevated and the patient narcotized. The median incision down to the transversalis fascia, or even to the anterior vesical wall, should be clean and even cut, all tearing of the tissues being, if possible, avoided, as pockets difficult of drainage are easily formed in this situation. The bladder should be carefully washed out with an antiseptic solution, preference being given to the boro-glyceride, especially if a cystitis of any form is present. The amount of distention of the bladder varies with each case, but I am convinced that in the majority of cases the injection of from four to six ounces will be found quite sufficient. The Petersen colpeurynter (or even sponges) is then introduced into the rectum and distended, and it is found that the amount of distension necessary can be better approximated if the distension of the rectum and injection of the bladder are concluded after the median incision is made, as the bladder can then be felt, and at times seen, rising upwards above the superior edge of the symphysis pubis, nothing intervening but the transversalis fascia and the always present pre-vesical layer of adipose tissue. The use of a metal catheter is an advantage as a guide for the incision. The bladder wall and the edges of the incision had best be retracted by passing traction threads, by means of a sharply curved needle on either side, but before placing these threads in position the catheter beak is pressed firmly and steadily against the anterior vesical wall, after pushing up the pre-vesical fat. (Guyon's maneuvre). This greatly facilitates the passage of the threads and materially aids the completion of the incision through the bladder wall. For our purpose a very small opening, just large enough to admit the cystoscope is all that would be necessary, and on completion of the examination a stitch or two would be sufficient to close the

wound. If the operation is carefully done in this manner the peritoneum is never brought into view, and in my study of this operation in the dissecting room, in 43 cases the peritoneum was not once opened, and in but a few instances was even seen. If conditions are present justifying the enlargement of the vesical wound, the intention primarily having been to secure a translucent medium for our cystoscopic exploration, the vesical wound may be enlarged for that purpose. Guyon treated two cases of tubercular ulceration in this manner, and advocates local operative treatment with suprapubic drainage. (*Revue de Chirurg.*, No. 4, 1888, and *International Journal of Surgery and Antiseptics.*) Iversen, of Copenhagen, has opened the bladder by the suprapubic section to inspect urine as it escaped from the ureters. and diagnosed a calculous pyelitis. As yet but little has been accomplished by the theoretical procedures of Tuchmann with the instrument devised by him for the purpose of compressing the ureters and collecting the urine separately from each kidney. The ureter compresser of P. Müller is also probably of little value, electro-cystoscopy offering us the only practical and accurate means of determining from which ureter blood or pus is discharged.

In practicing electro-cystoscopy a previously mentioned difficulty results from turpidity of the fluid contents of the bladder, the presence of blood in any considerable quantity making a very obscure field, the same being equally true when pus is discharged in any great quantity from the ureters or in cases of cystitis, even with preliminary irrigation. The details of an interesting case will illustrate in a manner the result of an electro-cystoscopic examination of a patient in private practice.

Upon July 18, J. R., age 31 years, an employè of the Cable railroad, while riding in a buggy was seized with a sudden urgent desire to urinate. He was at the time driving to his residence, and as he had urinated freely but a few moments before, the distance being short, thought he could wait until he arrived home. Each moment the desire grew more

urgent and the pain more severe and at the same time a sickening sensation began to come on him. On nearing home he experienced the sensation of a warm fluid coming from the urethra, and for a few moments he felt somewhat relieved, but was so sick he could with difficulty get out of his buggy, and immediately after being assisted into the house he passed into a vessel over a pint and a half of blood. The fluid which had escaped while in the vehicle proved to be blood, his underclothing being completely saturated with it. Upon emptying his bladder he felt perfectly at ease and slept for a few hours, when he was suddenly awakened by a return of the pain over the pubis, and shooting, darting pains in the perineal region, and passed nearly a pint of blood into a tin cup. He remained in bed until he consulted me. I prescribed an opiate, gallic acid and cold applications, advising absolute rest. The following day, July 20, disregarding my injunctions to keep quiet he called at my office. He had passed rather more than the usual amount of urine, with clotted blood at each effort and accompanied by severe pain. I then made a cystoscopic examination, first washing out the bladder with a warm saline solution, irrigating the viscus until the return seemed clear, injecting the bladder with a half a drachm of a four per cent. solution of cocaine, also injecting the urethra, and after ten minutes injected six and a half ounces of clear water, with a little salt added, and introduced the cystoscope. My first view of the bladder was quite clear, but the opening of the ureters could not be determined with any degree of accuracy. However, the field began to grow so obscure that I found it necessary to withdraw the cystoscope. I then endeavored to draw off the contents of the bladder with an ordinary soft catheter, but so much clotted blood came that I introduced a larger instrument and with difficulty drew off the remainder. After waiting an hour he rode home and aside from the pain of the examination he showed no ill effects, and the quantity of blood steadily decreased. On July 26 I again made an examination of his bladder, and soon found what I had been unable to see on

my first examination—a mass or congerie of large veins, of great size and varicose appearance, radiating apparently from the neck of the bladder, the walls of the bladder being deeply injected. Again, to my great disappointment, the field grew rapidly dim and blurred, and I found it necessary to give up my examination. This was followed by quite a severe hemorrhage. The bladder distended with blood and it was necessary to draw it off and prevent a recurrence, and I washed the viscus out thoroughly with a solution of alum, gr. xx to the pint, made ice applications and by the use of Artzberger's apparatus, an instrument made on the principle of a psychrophor, or blind return catheter, passed into the rectum, a stream of cold water was allowed to flow through it for a short time. No recurrence of hemorrhage took place and aside from the pain in the act of micturition, within a few days from the date of this examination, all traces of blood disappeared.

From a careful consideration of this case I am led to believe that the hemorrhage came from a ruptured varicose vein in the bladder. Admitting that I was unable to locate the bleeding point, yet taking into consideration the fact that the patient had been chronically constipated; that he had suffered somewhat from hemorrhoids for the last ten years, and that he had a marked varicocele, I cannot but believe that my conclusion was correct—all renal disease being, by careful observation, excluded; no symptoms of malaria; the sudden, profuse and threatening hemorrhage occurring in an otherwise healthy man of most exemplary habits; the cystoscope showing abnormally large veins and the absence of vesical tumor.

If free, warm injections had been possible with my cystoscope in position the bleeding point might have been accurately located and the bleeding checked without the necessity of withdrawing the instrument and loss of time.

Summary: The advantage of electro-cystoscopy combined with epicystotomy: Maintenance of a clear medium so essential to accurate observation; the diagnosis being made,

the possibility of immediate treatment of local conditions, such as tumors, calculi, neoplasms, foreign bodies, etc., collecting fluid from ureters directly, etc.

The danger of epicystotomy with an opening of such small size as to admit only the cystoscope for diagnostic purposes, could be but little greater than suprapubic puncture, and I question if as great, and the opening could be easily closed if no indications for local treatment are presented. If necessary perfect drainage is secured after the operation, permanent if desirable, especially in that class of cases with prostatic hypertrophy when removal of the obstruction is impossible or contra-indicated; then the epicystotomy of Hunter McGuire, a truly brilliant surgical procedure, is indicated and the necessary modifications in his classical operation easily made.

CHRONIC PELVIC CELLULITIS AND THE CONDITIONS WHICH SIMULATE IT.

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Chronic Pelvic Cellulitis is a subject which has attracted much attention during the last score of years, and in regard to which many diverse theories and opinions have been held by writers of authority. When Emmet called attention prominently to this disease, and described it as the most frequent of all pathological conditions in the female pelvis, his views presented so much of plausibility that they were very generally accepted by the profession, and the treatment based thereon became well-nigh universal. The hot douche was adopted as the routine prescription with nearly every practitioner, and even the laity became cognizant of its reputed virtues. The fountain syringe became as indispensable an adjunct to every woman's toilet as the nail-brush or the powder puff.

But after reaching this extreme, the pendulum of professional opinion began to swing in the opposite direction, as might have been expected. A reaction from the views of Emmet resulted from the investigations of pathologists, and more especially from the observations of operators in the new field of abdominal surgery. Conditions which, when examined by the vagina, had been confidently diagnosticated as

pelvic cellulitis, were found, when the abdomen was opened, either before or after death, to present phenomena entirely inconsistent with that diagnosis. From experiences of this kind a skepticism has arisen which is as extreme, and consequently as remote from the truth as the earlier opinions of Emmet. The views of the extremists in this direction are well illustrated by a quotation from a private letter which I received from one of them. He writes: "I have seen and examined patients of professional friends who presented all the old familiar symptoms, both subjective and objective, of cellulitis, peritonitis, or whatever you choose to call it, and have seen that abdomen opened within a few days or hours, and have, *without a single exception*,* found diseased tubes and ovaries. . . . . Where I find what I used to treat as pelvic cellulitis, *I always* open the abdomen or throw up the case in some one else's favor who has more faith in its curability than I have."

As is usually the case, the truth lies between the two extremes of opinion. To assert that every case which presents hardness and tenderness in the vaginal roof is a case of disease of the tubes or ovaries is as great an error as to assert that such symptoms always indicate the existence of chronic pelvic cellulitis. The amazing progress of the science and art of gynecology in the last few years has made it possible to discriminate between several conditions which may give rise to the formation of hard masses in the pelvic cellular tissue, palpable to the touch. To describe these various conditions, their pathology and diagnosis, shall be the purpose of this paper.

In an article read nearly two years ago, I laid down the proposition that "chronic pelvic cellulitis rarely, if ever, occurs except as a sequel of acute pelvic cellulitis."† Further study and observation have convinced me that I may make this statement still stronger, and assert that chronic pelvic cellulitis *never* occurs except as a sequel of acute pelvic cellulutis. It is gratifying to me to notice that my views on this

*Italics mine.

†Atlanta Medical and Surgical Journal, October, 1887.

subject are corroborated in the recently published work of Skene, one of the most clear-headed and practical observers in gynecology that this country has ever produced. He says: "I think the so-called chronic cellulitis, recognized and treated as such by some authorities, is nothing more than the products of the inflammation which remain after the inflammation itself has subsided."*

In order to elucidate my proposition, it will be necessary to refer briefly to the pathology of acute pelvic cellulitis, in regard to which no material difference of opinion exists among the best authorities. Acute pelvic cellulitis, in its clinical history, presents three stages—a stage of effusion, a stage of solidification and a stage of absorption or of suppuration. The stage of effusion is short, lasting from twenty-four to forty-eight hours, and during this time serum from the blood is freely poured out through the walls of the blood-vessels into the meshes of the cellular tissue. During this stage the roof of the pelvis presents a bulging into the vagina, and a a œdematous or boggy feeling to the touch. The stage of solidification rapidly follows, and the effused serum solidifies into a firm mass, presenting to the examining finger a hard, resistant feeling, which has been aptly likened by Doherty to a board. By this solidification of effused serum, the womb is immovably fixed, and if the inflammation be limited to one side of the pelvis, the womb is pushed to the opposite side. The stage of resolution begins as soon as solidification is complete, and is characterized by the gradual absorption of the effused mass. This stage varies greatly in duration, according to the amount of exudation and the vigor and recuperative power of the patient. During this stage the intrinsic tendency is toward recovery, which may be hastened by appropriate treatment or retarded by exposure or imprudence. In exceptional cases the inflammatory exudation breaks down into pus, forming a pelvic abscess, which, if not artificially evacuated, finds an exit by one of various channels, usually the vagina. Such an abscess may heal readily

*Diseases of Women, p. 559.

after the escape of its contents, or may continue to discharge for an indefinite length of time.

The question then arises, is it possible for a condition of exudation of plastic lymph into the pelvic cellular tissue to take place independently of an acute inflammatory process? From the standpoint of pathology, this question must be answered in the negative. The process of acute inflammation alone can lead to exudation of plasma of the blood into the surrounding tissues. In the condition which is known as chronic inflammation, a term regarded by many pathologists as a misnomer, the phenomena are not those of exudation with solidification and subsequent absorption, but, instead of this, are found cell proliferation and hypertrophy of pre-existing tissues. No observer, as far as I am aware, has ever claimed to have found changes of this character in the pelvic cellular tissue.

In the class of cases in which Emmet claims that chronic pelvic cellulitis is most freqently found, without a history of previous attacks of acute pelvic cellulitis, the researches of Dr. Henry C. Coe, of New York, show that no changes in the tissues are found after death to correspond with the symptoms existing during life. In cases of laceration of the cervix, with thickening or hardness and tenderness in the broad ligaments, typical cases of chronic pelvis cellulitis, from Emmet's point of view, *post-mortem* examination revealed nothing to account for the hard masses which were palpable to the finger by vaginal examination during life. Coe says: "In by far the greater number of cases where a well-marked laceration of the cervix was present, there was absolutely no induration whatever in the broad ligaments. This thickening, increased tension, or whatever it is, which we find at the examining table, and promptly enter into our case books as cellulitis, frequently vanishes after death, when the natural tension of the tissues has disappeared. I would add briefly that in only a single case have I felt satisfied that I found well-marked remains of a cellulitis in a case of laceration of the cervix."*

*New York Medical Journal, May 15, 1886, p. 545.

The appearances thus described are in marked contrast with those disclosed by examination of the pelvic organs after an attack of acute pelvic cellulitis, when uterus, ovaries and tubes are found immovably imbedded in a mass of plastic exudation, from which it is sometimes impossible to extricate them except by literally digging them out. The condition in such cases is well described by Hervieux, as a result of *post-mortem* examination of six cases, in which the disease had existed from four to twenty-two days. He says:

"The broad ligament on the affected side is converted into a hard tissue of a blueish gray or violet color, creaking under the scalpel and presenting the appearance of cartilage. The two folds of peritoneum are indistinct, as are also the connective issue and aponeuroses which separate them. There is only an indurated mass, in the midst of which the normal structures are confused and unrecognizable. The thickness of these indurations of the broad ligament varies from several millimetres to several centimetres. I have seen it reach the almost incredible thickness of four to five centimetres."*

Clinical observation furnishes evidence equally strong, and pointing in the same direction. If in a case of acute pelvic cellulitis, which has progressed through the stages of effusion and solidification, until it comes under the notice of the physician in the latter stage, a vaginal examination be made, the vaginal roof on one or both sides will be found to present a firm, resistant feeling to the finger, while the womb will be immovably fixed, so that any attempt to raise it will cause an increase of pain and, if force be used, may possibly be followed by a renewal of the acute inflammation. Under favorable treatment, the hard masses of plastic exudation will disappear in a period varying from one to four months. The subjective symptoms will be relieved only *pari passu* with the disappearance of the exudation in the cellular tissue. If the inflammatory process be limited to one side, the womb will be pushed over to the opposite side, and can be restored to its normal axis in the pelvis only after absorption of the exudation.

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*Archives de Tocologie, November 15, 1887; p. 975.

In a case of so-called chronic pelvic cellulitis, in which there has been no history of a previous acute attack, if a similar examination be made, the womb will be found to be of greater than normal size, and low in the pelvis, so that the cervix is supported by the posterior vaginal wall. On one or both sides of the cervix, extending outward, are irregular hard masses which are tender to the touch. The womb is not fixed in its abnormally low positlon, but may be easily elevated or moved from side to side. When the womb is raised upon the finger so as to lift it from the posterior vaginal wall and restore it to its normal elevation, and is maintained in that position for ten or fifteen minutes, the hard masses on either side of the cervix will be felt to slowly melt away under the finger until they have nearly or quite disappeared. As soon as the womb be allowed to descend the masses will slowly return. If the womb be permanently kept at its normal elevation by the daily insertion of a tampon of cotton into the vagina, for one or two weeks, it will be found that the womb diminishes in size, the pain and other pelvic symptoms disappear, nervous symptoms are relieved, the patient gains flesh and strength, and once more begins to feel that life is worth living.

From the clinical as well as the pathological aspect of the two classes of cases, the conclusion is irresistible that no connection exists between them. In the one case we have a typical picture of the inflammatory process. while in the other not a single feature of that process is to be detected. What, then, is the significance of the hard masses which are felt on either side of the uterus, in the broad ligaments, in so-called chronic pelvic cellulitis? The rapidity with which they disappear upon the elevation of the uterus in the pelvis, entirely negatives the theory that they are composed of any solid material, either exudation into the cellular tissue or hypertrophy of normal structures, while their immediate disappearance at death, as shown by the above quoted investigations of Coe, adds force to the negation. The only theory which appears to me to accord with these facts, is that the

hard masses on either side of the cervix are accumulations of venous blood within the distended venous sinuses, which are so abundant and so large in this locality. Such accumulations can be caused only by some obstruction to the venous current at some point within the pelvis.

A study of the anatomical distribution of the veins of the pelvis and of the inevitable results of uterine congestion upon the pelvic circulation, lends confirmation to this theory. The uterine vein passes downward along the lateral border of the uterus, receiving at various points horizontal branches from that organ. At a point about midway between the external and internal os it passes outward through the cellular tissue to the wall of the bony pelvis and thence upward toward the heart. In its passage through the cellular tissue of the broad ligament, it loses the characteristics af a vein and develops into a series of enormous distensible sinuses. Throughout its course it is entirely free from valves. Any obstruction at any point in the uterine vein must, therefore, necessarily result in damming up the blood behind the obstruction and causing a distention of that vein.

Whenever an injury of any kind to the pelvic organs takes place during labor and remains unrepaired, involution is interfered with. The womb fails to return to its normal size, and is, therefore, of greater than normal weight. Consequently the natural equilibrium between the uterine supports and the weight to be supported is destroyed, and the organ sinks below its normal level in the pelvis. Savage has shown that when the womb sinks below its normal level, traction is first exerted upon the cellular tissue of the broad ligaments, "especially where it surrounds and accompanies the uterine blood-vessels."* Traction upon an elastic tissue necessarily involves traction upon the blood-vessels within that tissue, and traction upon an elastic tube, like a blood-vessel, means diminution of its calibre and obstruction of the flow of blood through it. Hence, when the womb, in a state of sub-invo-

*The Surgery, Surgical Pathology and Surgical Anatomy of the Female Pelvic Organs. New York, 1880, Plates XVIII and XIX.

lution, from parturient injury, sinks below its level from increased weight, a condition exists which gives rise to obstruction of the uterine vein and its consequent distention. When the womb is raised the obstruction is removed, and the distention of the venous sinuses is at once relieved.

The beneficial effect of the vaginal douche of hot water in such cases admits of easy explanation. The action of hot water upon living tissue is to diminish the calibre of the blood vessels, and thus to lessen the amount of blood going to the part. The amount of blood to be returned through the pelvic veins, is, of course, proportionate to the amount of arterial blood received, and whatever lessens the one correspondingly lessens the other. Moreover, a diminution of the amount of blood going to the womb while that organ is in a state of sub-involution, permits a more rapid resumption of the normal process of retrograde metamorphosis, and consequently of a return of the womb to its normal weight, since, as stated by Thomas, "the element which sustains the disease is an excessive supply of blood."* In proportion as the weight of the womb is diminished, the organ rises toward its normal position in the pelvis, and the causative factor in the production of venous stasis is removed. The recognition of the beneficial effects of the hot water treatment, as advocated by Emmet, does not therefore imply an acceptance of the theory upon which that treatment is based. The same results may be much more rapidly attained by keeping the womb supported at its normal level in the pelvis by a tampon of cotton in the vagina.

Of late, Emmet has to some extent receded from the strong position formerly held by him, and in a paper read by him at the eleventh meeting of the American Gynecological Society, he said: "In the past, when I have used the term 'thickening in the broad ligaments,' I have not supposed that there existed between the folds of the broad ligament any deposits of lymph as a product of local inflammation, for I have long known the fact that the blood-vessels are not, as a rule,

*Diseases of Women, New York, 1880, p. 317.

destroyed by cellulitis, but in time, from long-continued obstruction to the circulation, and from a want afterward of the proper support which the connective tissue alone can give, the veins become greatly enlarged. I have already described elsewhere this condition of the blood-vessels, and whenever I have detected evidence of an old cellulitis with this so-termed 'thickening of the broad ligaments,' I have supposed that the enlargement was due to the dilated state of these veins."* It is difficult to reconcile Emmet's long recognition of these facts with his retention of the term chronic pelvic cellulitis, or with his remarks at the first meeting of the Alumni Association of the Woman's Hospital, in the course of which he said: "If there is thickening on one side of the vagina on a level with the cervix uteri, it must be cellulitis."†

There is another class of cases which were formerly regarded as chronic pelvic cellulitis, but whose true significance has been recognized only since the advent of abdominal surgery. I allude to disease of the Fallopian tubes and their distention by pus. Here we find masses on either side of the cervix, palpable through the vagina, and to a cursory examination closely simulating inflammatory deposits in the cellular tissue or distention of the pelvic venous sinuses. The womb in such cases is movable, and its elevation in the pelvis does not produce a disappearance of the enlargement. So closely may this condition simulate those to which I have already referred, that even so skillful a finger as Emmet's may not recognize the distinction. In the paper from which I have already quoted, he says: "During the past winter Professor Polk kindly invited me to witness an operation in his service at Bellevue Hospital for the removal of a diseased tube. The patient had suffered from a double laceration of the cervix uteri, and I had, at a previous examination, expressed the opinion that the subsequent condition was one of thickening and shortening of the left broad ligament from an old cellulitis. At the operation, to my surprise, no broad

*Gynecological Transactions, Vol. XI.

†N. Y. Med. Journal, May 15, 1886, p. 548.

ligament was found, and the enlarged tube lay directly against the side of the vagina. The relative position, or line, with the fundus of the uterus and the ovary, remained unchanged, and yet the fingers of the operator, as they grasped the tube, could be distinctly felt from the vagina and in contact with its walls."

In an uncomplicated case of pyosalpinx, the diagnosis may be readily made by attention to the distinctive features of the conditions with which it is most apt to be confounded. In the words of Bandl: "If with more or less severe inflammatory symptoms, masses form in the neighborhood of the cervix, or extend to the deeper portions of the pelvis, being doughy or soft at the beginning, but rapidly becoming harder, or if large, well defined swellings form in the true pelvis, in front of or behind the uterus, the process can be none other than phlegmonous inflammation of the cellular tissue."* On the other hand, the disappearance of the so-called thickening upon the elevation of the womb to its normal level, shows the case to be one of distention of the venous sinuses. But when, as is frequently the case, a pyosalpinx is complicated by acute pelvic cellulitis, or by venous engorgement, one condition may so mask the other, that a complete diagnosis will be difficult, or even impossible.

It often happens that acute pelvic cellulitis is excited by an extension of the inflammatory process from the tube to the neighboring cellular tissue. In such cases, one attack of cellulitis may follow another in rapid succession as long as the exciting cause exists, and the intervals between the attacks may be too short to allow of the absorption of the exudation. Yet this condition cannot properly be called chronic pelvic cellulitis, since each renewal of the inflammatory process is characterized by the three stages of effusion, solidification and absorption, which make up the clinical history of an isolated attack of acute pelvic cellulitis. The following quotation from Skene approximates very closely to my views on this subject: "Much has been said about chronic cellulitis,

*Cyclopedia of Obst. and Gyn., Vol. XII, p. 133.

but I have never been able to recognize any such condition. Chronic suppuration in a badly drained abscess may go on for any length of time—this we often see; also, frequent or repeated attacks of cellulitis may occur. But a chronic or continuous inflammation, such as we see in inflammation of the mucous membranes, is something which I have never met with in practice. This is quite in accord with what we know of cellulitis elsewhere, where the process begins, progresses and ends, and recovery follows, or it may be that the inflammation progresses to the stage of suppuration, and for some reason suppuration is kept up; but this is simply a chronic condition of one stage of the process."*

In a paper read before the Medical Association of Georgia in April, 1887,† I described a procedure by which I have been able to cut short attacks of acute pelvic cellulitis, when seen in the stage of effusion, before solidification has taken place. This procedure consists of drawing off by means of the aspirator the serum effused into the meshes of the cellular tissue, and thus effectually forestalling the later stages of solidification and absorption. In two cases of rapidly recuring attacks of pelvic cellulitis from disease of the tubes, I have pursued this course with the result of effectually jugulating such attacks, and thus preventing fresh deposits of plastic lymph. The following case will illustrate this mode of treatment:

Mrs. L. H. B., married, age 42, multipara, had suffered for many years from repeated attacks of pelvic inflammation, occurring at intervals of from three to nine months. These attacks had increased in intensity, until they were characterized by general peritonitis, delirium, extreme collapse and subsequent prostration, in addition to the usual symptoms of pelvic cellulitis. When first seen by me she was in the fourth day of such an attack and in appearance was almost moribund. She survived the attack, however, and in a fortnight was convalescent. Vaginal examination then revealed the

*Diseases of Women, p. 559.

†Atlanta Med. and Surg. Journal, August, 1887.

pelvis completely blocked up by plastic exudation, the womb absolutely immovable. On the left side the inflammatory mass could be felt above the brim of the pelvis. By means of the hot vaginal douche, frequently repeated, and the application of Churchill's tincture of iodine to the vaginal roof and the abdomen, the absorption of this exudation was promoted so that in three months it had nearly all disappeared. The tumor projecting above the brim of the pelvis could then be felt by its characteristic outline to contain a distended tube. An operation for its removal was refused by the patient. About four months after the former attack I was suddenly summoned and found the patient suffering with high fever, pain and tenderness in the abdomen, and frequent and painful micturition. She recognized the symptoms as those which always ushered in her attacks of pelvic inflammation. By vaginal examination I found the cellular tissue of both broad ligaments in a state of tumefaction and presenting to the touch a boggy, œdematous feeling, which I have learned to recognize as indicative of the stage of effusion of acute cellulitis. The patient was etherized and an respirator needle thrust into the pelvic cellular tissue at four successive points and between two and three ounces of serum withdrawn. The swelling of the tissues immediately subsided. When the patient recovered from the ether she expressed herself as relieved from the pelvic pain, the pulse and temperature rapidly fell and in twenty-four hours she was convalescent. Examination showed no deposit in the cellular tissue, although the distended tube could still be felt high up as before. It is somewhat remarkable that she has not had another attack of pelvic inflammation up to the present time, although thirteen months have now elapsed since the one referred to.

A method similar to this has been advocated by Hervot, under the name of "*ponction capillaire aspiratrice*,"* for the removal of encysted collections of serum in the progress of chronic pelvic cellulitis. From the reports of his cases I am led to believe that the condition treated by him was identical

*Archives de Tocologie, July 30, 1887.

with the case just described. He failed, however, to recognize the occurrence of repeated attacks of acute pelvic cellulitis, and thus appears to have overlooked the principle upon which the success of his treatment was based.

It has been maintained by some authorities in gynecology, that acute pelvic cellulitis does not occur as an idiopathic condition, but only by extension of inflammation from some neighboring organ, the uterus, the ovaries, or the tubes. W. Gill Wylie, for instance, says that "four-fifths of the so-called 'minor inflammations' are due to an extension of the inflammatory process through the tubes. The indurations which used to be called cellulitis are really such prolapsed tubes and ovaries surrounded by adhesions."* Wm. M. Polk similarly says: "In one hundred cases of 'cellulitis,' the pathological conditions which we are taught belong to that disease were not found. Pelvic inflammation is the direct product of tubal disease."† My experience has led me to a different conclusion. While not denying the greater frequency of secondary cellulitis, I am sure that cases do occur in which the disease originates in the pelvic cellular tissue. Since I introduced the method of treatment referred to above, of aspiration of the tissues when seen in the stage of effusion, I have met with two cases in which the disease being effectually aborted by this means and the patient well in forty-eight hours, careful examination revealed no derangement of the uterus, ovaries, or tubes, and the subsequent history of the patient showed her to be free from pelvic disease. In each of these cases the patient was nulliparous, and the cellulitis resulted from imprudence or exposure during menstruation, thus corroborating a recent statement by Goodell, that "in virgins the disease is due to exposure to cold at the catamenial period."‡

Yet another condition which simulates chronic pelvie cellulitis, and which was to me a source of error until its true

*New York Medical Journal, May 15, 1886, p. 548.

†American Journal of Obstetrics, October, 1888, p. 1039.

‡American Journal of Obstetrics, October, 1888. p. 1037.

nature was pointed out by Coe,* consists in a contraction of the utero-sacral ligaments, so that they stand out as firm as cords, extending backward from the cervix to the sacrum. Luschka has demonstrated the presence of muscular fibres in these ligaments, and has given to them the name of "*retractores uteri.*"† This condition conveys to the finger a sensation very similar to that of plastic exudation in the cellular tissue, and has been described by Emmet as one of the evidences of the existence of chronic pelvic cellulitis. I have, in several instances, been able to verify the observation of Coe, that when the patient is etherized, such indurations can no longer be felt, showing conclusively that they are not due to organic changes in the tissues. It is still further stated by Coe, that upon *post-mortem* examination he has found that the condition no longer exists. An appreciation of the significance of these facts will doubtless prove a great source of relief to those who, like myself, have deemed it necessary, in accordance with the dictum of Emmet, to overcome this condition before undertaking any operation about the cervix. I can recall cases in which, as a preliminary to the operation of trachelorrhaphy, I have spent months in trying to overcome this utero-sacral contraction, thus entailing upon the patient an expenditure of time and money which my later experience has shown to be entirely unnecessary. I now disregard, as obstacles to operation, all conditions of hardness in the roof of the pelvis, except those in which the womb is immovably fixed by exudation in the broad ligaments. I am inclined to the opinion that even this condition might safely be disregarded, provided the pulse and temperature fail to show the presence of an actually existing acute inflammatory process.

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*New York Medical Journal, May 15, 1886, p. 545.

†Anatomie des Weiblichen Beckens, p. 361.

THE MEDICAL TREATMENT OF FIBROID TUMORS OF THE UTERUS.

By Bedford Brown, M. D.,

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My personal experience in the treatment of fibroid tumors of the uterus is confined to the observation of twenty-seven cases which have occurred in my practice during the past thirty-seven years. Some of these cases have only been under my observation for one or two years, some for five or six years, while a certain proportion have remained under my care from twelve to fifteen years. While this experience is not very extensive, nevertheless the results of the careful and studious observation of the progress and results of treatment of this number of cases are of some value as an addition to the history of this class of affectious. In these twenty-seven cases are included all classes, from the most grave, in constitutional effect accompanied with alarming hemorrhagic tendencies, peritonitis, septicemia and general prostration, to those in which the system never sympathized in any serious degree. And yet in not one of these persons so affected have I seen the occurrence of death. On the contrary in all the cases remaining under my observation sufficiently long, there has invariably been improvement more or less marked in several instances, at least one-third amounting to a positive recovery.

In some instances I have had an opportunity of watching the incipient beginning, the progress, gradual development, and, finally, the decline of certain cases covering the different stages of a very interesting history.

In one case, the most serious and dangerous coming under my care, my attention was called to it when the tumor was not larger than a walnut. I observed the gradual growth of this tumor from this small beginning during a period of eight years until the abdomen was filled to repletion with an enormous tumor, subperitoneal in character, while another, submucuous in location, distended the uterus to the full capacity of the pelvic cavity, crowding every other organ out of position. I witnessed the repeated copious and dangerous hemorrhages to which this patient was subjected. The numerous attacks of localized peritonitis; the loss of appetite, of flesh and strength; the habitual quick pulse, and terrible mental depression, and nervous prostration. I then again had the opportunity of seeing the arrest of growth of these tumors, their gradual diminution and subsidence of all constitutional symptoms, and, finally, their complete absorption. Through the abdominal walls the bare rudiment of a tumor can be detected now, and the uterus has been reduced to the normal dimensions.

These various stages of growth and decline occupied about fifteen years. The growth began at about the age of thirty and terminated just before the patient reached forty-five. She has not quite passed the menopause yet.

The growth was in progress about ten years, and the period of reduction occupied about five years. The general health of the patient now is good aud her strength fair. Forming an opinion based on long experience I have reached the conclusion that by proper and judicious management, as a rule, death may not only be averted under the most untoward circumstances, but that the great majority of cases can be so far improved by medical treatment and regimen as to render life comfortable and bring the disease to a point of reduction when the health is virtually restored. As an evi-

dence of the truth of this statement, I will cite another case of interest bearing on this question.

The subject of this case about ten years ago gave birth to a child, in her twenty-fifth year. In twelve months subsequently she became troubled with metrorrhagia which continued to increase until it became so constant that the woman was not an hour without some sanguineous discharge, amounting once or twice monthly to dangerous hemorrhage. It was found, on examination, that the uterus was so large as to very nearly fill the pelvic cavity, and to contain a submucous fibroid of probably nearly three inches in diameter. The os uteri measured about two inches in diameter, was patulous, puffy, rather livid, with numerous small blue tortuous veins plainly perceptible traversing the mucous surface accompanied with marked œdema of the cervix. The constant and severe pelvic pains in this case from distension, the irritation of bladder and rectum, exceeded anything of the kind I have ever witnessed in a similar case. In rather more than twelve months from the beginning of the metrorrhagia, two hard fibrous tumors began to develop in each breast. From these tumors, as central points, radiated pains of a neuralgic character, of the most excruciating intensity, extending over the chest and down the arms in the direction of the brachial nerves. The pains increased in intensity in proportion to the increased growth of the fibroid tumor, and in all my experience I have never witnessed more intense suffering than this patient underwent, as every description of opiate and anodyne was tried without relief.

Both mammary tumors were finally removed, but the neuralgic pains continued in the same intense character in not only the locality of the tumors after cicatrization, but following its former course down the arms.

A remarkable feature of this neuralgia was the violent attacks of increased pain caused by the slightest muscular movements of the arms. A thorough course of electrical treatment not only relieved the neuralgia of the chest and

arms, but when applied to the uterus also afforded relief to the uterine pains.

During a period of ten years this woman must have suffered from two hundred attacks of uterine hemorrhage. Consequently, she became greatly anæmic, alarmingly prostrated, and at one period dropsical. Under treatment the neuralgia has been entirely relieved, the hemorrhages have ceased, and menstruation is normal.

The reduction of the submucous fibroid has been steady, until it has about disappeared, and on exploration the uterus is about two and three-quarter inches in dimensions. The woman has gained strength and flesh, and now presents a robust appearance. I alluded to a feature in this case which I have witnessed in five other cases of fibroid, and I regard it as somewhat distinctive of this affection. At least, I have seen it in no other.

The condition I allude to is œdema of the cervix uteri. It does not appear in either the very earliest or later stages of the case, but at that stage where the submucous fibroid reaches a size sufficient to distend the uterine cavity to at least three inches in diameter, and begins to dilate and expand the cervix at the internal os. At first the cervix appears to be hypertrophied, but in reality is not. It is in a state of genuine œdema, accompanied with passive engorgement, doubtless due to obstruction to the venous circulation in the cervical vessels, itself due to pressure exercised on the vessels of the body of the uterus by the internal mechanical pressure of the growing tumor. In the cases coming under my observation the cervix presents a pale, livid complexion, and can be indented by pressure, the pit being of some duration, as witnessed in anasarca of the skin. The cervix is always twice as large as natural, and is soft, pulpy and putty-like to the touch.

I have never observed this pathological condition in any other affection of the uterus. In this class of cases, in proportion as the fibroid increases and uterine body expands and encroaches on the cervix, that portion of the organ is grad-

ually obliterated, as in the advancing stages of pregnancy, when the local œdema disappears as the cervical obliteration progresses; and when the tumor has grown sufficiently large to expand and obliterate the cervix, then only the attenuated, hard, cartilaginous lips of the os uteri remain. At the stage of œdema the os is usually found in the centre of the pelvic axis. At a later period, when absorption has taken place, it is displaced, and is found either under the pubic arch or thrown back into the hollow of the sacrum, the distortion being caused by the expanding force of the internal growth.

On the contrary, when the growth of the tumor and the processes of reduction and absorption begin, then there is a reversal of changes in the condition of the os and cervix uteri. These portions of the uterus then gradually return to their former shape and softness, while the vagina, from a mere short *cul de sac*, regains its elongated, canal-like form.

TREATMENT.

In the process of tumor building there are manifestly two opposite pathological conditions, one a positive, the other a negative character, existing. These conditions consist of increased cell proliferation and organic growth, and deficiency of tissue metamorphosis to counterbalance the act of superabundant deposition. Therefore, whatever in the way of diet, regimen, exercise, period of life or other cirumstances may tend to increase cell proliferation beyond the powers of nature to maintain an equilibrium, will, when brought to bear upon the uterine structure, promote the fibroid growth. On the contrary, whatever of food, habits, medicine or period of life will correct this perverted state of the nutritive processes of the part will diminish abnormal cell proliferation and restore healthy tissue metamorphosis, and must curtail fibroid growth.

I think there can be no question that discrimination in regard to the character of the food used by these subjects exerts an influence over the growth of fibrous tumors. This accords with my own experience. The curtailment in sup-

plies of those varieties of food containing largely, if not wholly, amylaceous and fatty materials does retard these growths. On the contrary, they grow more rapidly when starchy and fatty matters are more largely consumed. Lean fresh meats, green vegetables and fruits containing but little starch, skimmed milk and eggs, I have found effected this object best.

Then the power of ergot to diminish the calibre of the nutrient vessels of the uterus, and in this way curtail the hypernutrition and growth of the tumor is so well understood as to require scarcely a notice here, barely excepting the special preparations of that article and the method of administration. I have found the so-called normal liquid ergot of Parke, Davis & Co. an excellent preparation for internal or hypodermic use, and I regard it as particularly well adapted to the latter. It is very unirritating, and acts with great promptitude in arresting haemorrhage even of the greatest magnitude. I believe that the continuous internal use of this article in twenty or thirty drop doses three times daily will accomplish more in the end than the hypodermic method. With this may be alternated a pill after the following formula:

℞.

Ergotini - - - - -	ʒij
Strychninæ - - - -	gr. i
Quininæ salicylat. - - - -	ʒiss
Acidi arseniosi - - - -	gr. i

M. pil xxx.

One of these should be taken three times a day in connection with the following combination of remedies:

℞.

Flu. ext. hydratis can. - - -	℥ss
Aquæ cinnam. - - - - -	℥v
Flu. ext. phytolaccæ, decand. - -	℥ss
Sodæ bicarb. - - - - -	ʒij

M.

These remedies in this particular combination I have found useful in retarding and diminishing the growth of fibroid tumors.

The hydrastis and phytolacca both possess properties which give them power to retard abnormal uterine action and promote absorption. But I am persuaded that there are other therapeutic agents which, acting on the blood formation and through the circulation, influence the process of nutrition, rectifying that important function, when deranged, in a remarkable manner, and in that way correcting those excesses of local action which produce local disease and abnormal growths. Some years since, with a view of carrying into practice this idea, I began a series of experiments for the purpose of testing the influence on the progress and development of fibrous tumors by acting on the nutritive functions by means of those preparations containing phosphorus, lime and soda. I had at that time four cases of fibroid under my care. I selected to be used in these cases the syrup of the lacto-phosphate of lime and the syrup of the hypophosphites of lime and soda, as prepared by McArthur. That was about eight or nine years ago. Since that time I have had nine cases under my care. Six of these cases have remained under my inspection, and with one exception are so decidedly improved as to need no further treatment. The one exception came under my care during the spring, and is now improving under treatment. Three of these cases alluded to have left my vicinity and migrated to a distance. In these cases the syrup of the lacto-phosphate of lime and the syrup of the hypophosphites were administered in teaspoonful doses each three times a day continuously for months, and with slight intervals, so as to give rest to the stomach, for years, that there might be maintained on the system a permanent influence.

The character of most of the cases subjected to this treatment was of the most aggravated form, and had previously been treated by means of ergot internally and hypodermically, the bromides, etc., without in any way retarding their progress. In some constitutions the response to treatment is much more prompt than in others. Some cases improve up to a certain point, then cease and wait for the menopause to

complete the process. Some recover entirely before that period, while others again are very resistant to treatment in any form. But the treatment by means of the phosphates has given me far more satisfaction than any other.

This treatment to produce favorable results must be pursued systematically, regularly, perseveringly and continuously. Taking a retrospective review of the cases treated by myself, I will state here that the first two cases which came under my charge about thirty-five years ago, in absence of knowledge of better remedies, were both treated by means of liquor arsenici et hydrargyri iodidi in one and two drop doses continued for two or three years with occasional intermissions with a view to its alterative effect. The tumor in both of these cases was in the cavity of the uterus, and sub-mucous in character. The females belonged to the negro race and had borne children. In both there existed decided menorrhagia, and one was subject to periodical hemorrhages. In both cases also the uterus was distended so as to fill the cavity of the pelvis.

These cases are reported here and are of interest because of the results of the treatment.

In the worst case, after three or four years' treatment by this remedy, the tumor began to diminish and finally became entirely absorbed. The other improved, but did not recover entirely until after the meno-pause, Ergot was also used occasionally in both to repress hemorrhages. It was about this period that Dr. Simpson introduced his treatment by means of the bromide of potash.

I continued to use the treatment of Simpson, I thought with some benefit, in connection with ergot up to the period when I adopted the use of the phosphates.

Subsequently to these two cases I tested further the powers of the solution of Donovan, but was not so fortunate. The therapeutic action of the combination of the lacto-phosphate of lime and hypophosphites in the seven last cases coming under my care, has been exceedingly favorable and has been of a two-fold character.

The earliest perceptible effect exerted was on the tendency to hemorrhage. In every case this tendency has been diminished and so decidedly lessened in most of them as to afford relief. In two cases, one of which was the worst in this respect that I ever witnessed, the hemorrhages were frequent and often dangerous in extent. This patient, after taking these remedies for three or four months, found herself without her usual hemorrhages, and not long after found herself minus her menstrual periods. She at once became alarmed and protested that she would take no remedy which would affect her in this way. She had a firm conviction that her condition was due to the remedy used. It was suspended, and after a few months the hemorrhages returned. The remedy was a second time recurred to, and with similar effect, and again suspended. Under treatment by the phosphates, and occasionally ergotine, and strychnine, the hemorrhages finally ceased and the absorption of the tumors—there were three of them—progressed.

In the case of another patient while under the phosphate treatment a suspension of menstruation occurred and this patien refused to continue their use. While the tumor in this case was large and impaired the general health seriously, there were no hemorrhages. The second effect of the phosphates in these cases is to promote absorption and arrest the growth of fibroids. In all these cases there was arrest of growth and diminution. In several (to be more definite, in three,) the diminution was very marked. In this case there was complete absorption. Thirdly, the action of the combined phosphates in these cases, in which there is always impairment of the general health, is to improve the condition in a manifest degree of the constitution, and in every case have proven themselves genuine restoratives. In these cases in which our greatest renovator, *iron*, is inadmissible, the phosphates fill a most important place.

CASE I.

Mrs. M., aged about 32 years, the widow of a Confederate officer who fell at the battle of Seven Pines only two months after marriage. She has never borne children. She had a sub-mucous fibroid distending the uterus to the full capacity of the pelvic cavity. Her general health was much impaired from the depressing influence of hemorrhages, pain and local irritation. I presumed that the tumor had been in progress at least four or five years. Various medicines, as ergot, the bromides, and iodides, with tonics, were resorted to without benefit. About this time, from some cause not well defined, extensive bronchitis with some indications of hectic appeared. For this complication McArthur's syrup of hypophosphite was used, which was subsequently united with the syrup of lacto-phosphate of lime. The symptoms arising from the tumor improved so much as to justify their continuation. After a time all hemorrhages ceased and menstruation became regular and the tumor began gradually to diminish and in two or three years of this treatment became so greatly lessened as to give no trouble. This patient subsequently removed from the city to a distant point. This was the first case in which I used the lacto-phosphates and hypophosphites in fibroid tumor of the uterus.

At this stage of our subject, for the purpose of illustration, I deem it proper to present the history of four or five cases in which this method of treatment was fully tested.

CASE II.

Miss L., aged 30 years, unmarried. Had previously enjoyed good health. On examination three sub-peritoneal fibroids were found as large as the fist, each. No pain or tenderness. Menstruation normal. This case came under my charge about fourteen years ago. For several years she took the chloride and bromide of ammonium. The tumors continued to increase, but gradually, until the abdomen attained the size of a pregnant woman at full term. In the mean time menstruation became irregular, accompanied with

menorrhagia, which increased in extent every month until it amounted to alarming hemorrhages. These hemorrhages now became both frequent and dangerous in extent. The general health and strength at this stage became greatly depressed. The pulse was frequent and feeble. There was great emaciation, and the prostration of mind and body was so great as to confine the patient to bed. An examination made at the time these hemorrhages began, revealed the presence of a sub-mucous fibroid. This increased gradually until the cavity of the pelvis was filled completely. When first detected there existed oedema of the cervix uteri. Ergot used hypodermically and internally, at first controlled the hemorrhages, but when the walls of the uterus became thin, attenuated, and paralyzed the muscular tissues from over-distension, then the remedy failed utterly, and injections of Monsel's solution in the uterus and tampons could only be relied on to arrest the terrible hemorrhages. When these were arrested then followed a series of symptoms denoting septicæmia. With a view of improving the general health of the patient, I prescribed the syrup of the lacto-phosphate of lime and McArthur's hypophosphites of lime and soda. The general condition of the patient improved, and the tendency to hemorrhages gradually diminished. It was continued, the patient in the meantime improving in every respect. It was now perceived that the tumors were gradually lessening. This patient in the past four years has undergone a great change for the better. The tumors in the abdomen are now so small as to give no trouble. The sub-mucous tumor has about disappeared; she has an occasional return of menstruation, but no hemorrhage for nearly two years.

The general health and strength are good. In this history I have merely stated facts. We can draw our own inferences. I cannot for a moment doubt that the phosphate treatment was the chief factor in the improvement in this case.

CASE III.

Miss P., an unmarried lady, æt. about 32 years, came under my charge about eight years since. Her general health

had been declining for several years. She suffered so much pain in abdomen and back as to disable her. A uterine examination in this case revealed the presence of a sub-mucous fibroid, not only filling the pelvic cavity, but a subperitoneal tumor also jutting several inches above the brim. Notwithstanding this condition of affairs, menstruation had been regular as to time, but consisted largely of a dirty, reddish colored fluid. This patient took ergotine in combination with strychnia for several years, and occasionally arsenic, but without perceptible effect. She then took the phosphates, with not only marked benefit to her general health, but with equal benefit to the local trouble. After its use for six months there was manifest reduction. But now this was attended with an entire suspension of the menstrual functions. At this the patient beeame alarmed and refused to continue the remedy. Subsequently I used, as applications to the os and cervix uteri, Churchill's tinc. iodine and flu. ext. ergot with good effect, semi-weekly. These tumors are now so far reduced as to give the patient no trouble. Her general health is excellent, and her menstruation regular. In this case, twice a week, the iodine and extract of ergot were freely applied alternately, not only to the os and cervix, but to the entire roof of the vagina. When the lacto-phosphate of lime was suspended, the syrup of the hypophosphites was continued with excellent effect. The tumor in the cavity of the uterus has been almost absorbed, and whereas the vagina was a mere short *cul de sac,* scarcely an inch and a half in length, the os being thrown up under the arch against the urethra, it has now nearly resumed its normal length. The sub-peritoneal tumor is scarcely perceptible.

CASE IV.

Mrs. H., a married woman, aged 35 years. I had treated this patient for endometritis several years previous to this, and after treatment she conceived and gave birth to a child. It was subsequent to this that a sub-mucous tumor began to develop and give rise to frequent hemorrhages and pelvic

pain. This tumor continued to increase and distend the uterus until the cavity of the pelvis was not only compactly filled, but the organ jutted above the brim. Various remedies were resorted to in this case, among others ergot, hydrastis, phytolacca, the bromides. Finally, some three years since, she began the phosphate treatment and has maintained it steadily since. The tumor is almost entirely absorbed, and where the uterus was immovably fixed in the pelvis from distention of the tumor, the organ is now perfectly movable and measures about three inches in length. During the early stages of this case the cervix was for many months in a highly oedematous state. This woman has now been under observation for about eight years, and while she has suffered much from pain, and there was at one time great emaciation from constant loss of blood, there has never been at any time the least pyrexia.

The general health of the patient is now excellent and even robust. All hemorrhagic tendency has entirely ceased. Menstruation is regular and normal.

CASE V.

Mrs. D., a married woman, aged 52 years. This patient in early life had borne children. For some years previous to the development of tumor she had been subject to endometritis. Between the years 1878 and 1883, I removed two polypi of considerable size from the uterus. About five years since a sub-mucous fibroid began to develop, accompanied with much hemorrhagic tendency. The uterus in its cavity measured around its growth four inches. The os and cervix for twelve months were much enlarged from oedema. An impression firmly made by an instrument left an indentation similar to that in anasarca. The cervix measured at least two inches across.

Twelve months ago I adopted the use of the phosphates in this case in connection with flu. ext. ergot and flu. ext. hydrastis canadensis, internally. I also applied, semi-weekly, Churchill's tinc. iodine and the extract of ergot alternately.

There has been very decided improvement in this case in every particular. The hemorrhages have ceased entirely. The tumor is very greatly reduced. The menstruation at this late period continues regular, and the general health is good.

In these cases of excessive hemorrhage it is our duty not only to adopt means to arrest the immediate attack, but to go further than that and so shape our treatment as to control or subdue that tendency. I believe the phosphatic treatment persistently pursued, the ergotine and strychnia internally, and the local application of the iodine and the extract or normal liquid ergot alternately every third day, will so impress the general and local circulation and the process of nutrition as to regulate this peculiar tendency.

I attach very considerable importance to the influence of local treatment applied in this way as a means of aiding in controlling hemorrhage, and promoting the reduction and absorption of the fibroid. The iodine and ergot are both readily absorbed, and exert their peculiar influence with more or as much force than when taken internally. At all events, in my hands the practical results have been good.

CASE VI.

Mrs. M., a colored woman, aged about 40 years. The case came under my charge in March last. The woman had three sub-peritoneal tumors, each being about three inches in diameter. There exists also in the uterus a small sub-mucous tumor. She came under my treatment for metrorrhagia, and very soon after peritoneal inflammation set in. After the subjugation of the peritonitis, she took the following formula:

R.	Ergotini - - - - - -	f ʒi
	Strychninae - . - - - -	gr. ½
	Acid arseniosi - - - - - -	gr. i
	Quininae sulph. - - - -	ʒi

M. pil. No. xxiv.
One after meals.

The action of this not being favorable, she took a teaspoonful each of syr. lacto-phosphate of lime and syr. hypophosphite of lime and soda before each meal, and twenty

drops each of flu. ext. hydrastis can. phytolacca decand. after meals. The hemorrhages have ceased. The woman has gained sufficient strength to resume her vocation, and the tumors have rather diminished than increased as before.

For the purpose of illustrating more clearly my experience in the use of these preparations as correctives of the more acute forms of perverted local nutrition, and as a means of promoting absorption of inflammatory products, the results of this malnutrition, I will diverge from the subject of the treatment of fibroids and present here a statement of my personal observation of their peculiar action in acute adenitis, whether simple or contagious in origin. In my statement of the history of the following cases I confine myself to simple facts alone.

CASE I.

A girl, aged 9 years, had a scarlatinous rash and sore throat. After the subsidence of the rash, tonsilitis of a very aggravated form developed. The cervical and sublingual glands now becoming infected, a violent and painful form of adenitis appeared, in which the swelling and oedema became so extensive as to endanger life. The usual standard agents in these cases were tried but without results, and the case presented an exceedingly unfavorable aspect. Without much definite expectation of favorable results, the lacto-phosphate of lime in drachm doses was given three times daily, and McArthur's hypophosphite in fifteen drop doses every two hours. In twenty-four hours the progress of the adenitis was arrested. In forty-eight hours there was a manifest decline in the enormous swelling, so that the child could begin to take nourishment. In three days the improvement was so decided as to make it certain all danger had passed, and convalscence was speedy.

CASE II.

After a severe attack of measles, this, a child aged 2 years, was attacked with extensive adenitis of the glands of the neck, which threatened to prove fatal. The same remedies as in the former case were administered in this, and while not quite so

speedy in their action in arresting the morbid process and promoting absorption, had within a week placed the patient beyond all danger. In both of these cases resolution was complete, and all tendency to suppuration prevented. The prevention of the pyogenic process is one of the most conspicuous effects of the phosphate treatment.

CASE III.

A child, aged 3 years. After apparent recovery from attack of scarlet fever, was attacked with a very violent and grave form of adenitis of the cervical glands. Very soon the pulse became exceedingly frequent and the temperature amounted to 106½°. The swelling of the tissues of the throat and neck became so great as seriously to interfere with deglutition. The only treatment in this case consisted of the administration of one grain of antifebrine every three hours, and fifteen drops of the syrup of hypophosphites every two hours, and half drachm of syrup of the lacto-phosphate of lime three times daily. The improvement, in all the symptoms, in this case was rapid, and within a week the recovery was complete.

CASE IV.

A young married lady of strumous tendency, and very delicate constitution, from supposed effects of cold had an adenitis of violent character, involving the glands of the throat and neck, accompanied with very extensive oedema, and great febrile reaction. This patient took, every three hours, thirty drops of McArthur's preparation of hypophosphites, and the lacto-phosphate of lime three times a day. The restoration of this patient was complete within ten days. It will be observed in the reports of these cases that the effect of the remedy in all was to arrest the progress of adenitis, to prevent suppuration, and lastly, to cause rapid absorption of all exudative products. It will also be seen that the remedy was given in small doses and at frequent intervals. The object of this was to accomplish the saturation of the system with the agents as speedily as possible.

After witnessing the really marvelous effects of these agents in acute glandular affections, I am constrained to believe that they must exert a very great influence on the functions of that system generally, as well as on the process of metamorphosis of tissue by promoting its disintegration and removal.

In the administration of the hypophosphites and lacto-phosphates in cases of grave malnutrition giving rise to serious local lesions, excessive exudation of morbid products or of abnormal cell proliferation producing unwonted tissue growth endangering health and life, I have found them to accomplish more effectually than any other remedies. I wish to dwell more forcibly and specially on the necessity of the rapid and thorough *saturation* of the circulation with the phosphates of lime and soda, as a means of restoring the lost equilibrium of nutrition, arresting increased cell proliferation and exudation and promoting their absorption. Therefore, I contend these agents have not been given in sufficient quantity heretofore to regulate the process of nutrition. I have in grave and serious cases administered as much as a drachm of the syrup of the hypophosphites every two or three hours, and two drachms of the lacto-phosphate three times daily until the object was attained. In summing up the results of medical treatment of fibroid tumors, it may be stated, that the continuous administration of ergot in the form of ergotine or fluid extract, does retard the fibroid growth, does lessen the tendency to hemorrhage, and in certain stages of fibroid growth, on occasion of hemorrhage, given hypodermically, or *per orem*, will arrest it. But at an advanced stage, when the growth of submucous fibroid becomes very great and the walls of the uterus have become very thin and attenuated from over-dis tension and absorption and paralysis of uterine muscle, then the ergot ceases to act as an hæmostatic. The fluid extract of hydrastis does act on the growth of fibroid to a limited extent by diminishing the circulation, and also lessens the tendency to hemorrhage. In my experience it acts better when given in combination with the phytolacca decandra.

Local treatment by means of iodine and ergot applied extensively over the cervix and the roof of the vagina give important aid in promoting the same therapeutic results.

By a judicious and timely combination of the various therapeutic agents referred to in this paper, I believe the great majority, if not all, cases of uterine fibroid may be shorn of their worst features; that the sufferings of those so afflicted may be greatly alleviated; that life may be prolonged; that all may be benefited and a certain proportion cured. I am in a position to assert truthfully that benefit has resulted from treatment in every case when the patient was under charge sufficiently long to get fully under the influence of medical treatment. Hence, I am convinced by a long and not very inconsiderable personal experience that medicine can do much, and is capable of doing still more in the future for the benefit and relief of these cases.

A SUCCESSFUL VAGINAL HYSTERECTOMY FOR CARCINOMA UTERI.

By Wm. H. Wathen, M. D.,

Louisville, Kentucky.

Professor of Obstetrics and Diseases of Women, Kentucky School of Medicine; Ex-President of the Kentucky State Medical Association and Chairman of the Section of Obstetrics and Gynecology, American Medical Association.

I had written a paper on "Hysterectomy for Malignant Diseases of the Uterus," to read before the Southern Surgical and Gynecological Association in September, but after the meeting was deferred to December, I read the paper before the American Association of Obstetricians and Gynecologists at the meeting of the Congress of Physicians and Surgeons in Washington. I again find my name in the new programme to report upon the same subject. It would not be courteous to the members of this Associaton for me to read that paper again, for an extended abstract has been published in many of the medical journals in different sections of the country.

But that I may in a degree fulfill my promise, and I have concluded to report a successful vaginal hysterectomy which I did in October, and to make some remarks upon the improved *technique* of the operation, especially upon that part of the details relating to hemostasis. I operated in the forenoon of October 9, at the Norton Infirmary, of Louisville, on Mrs. B. A., 34 years old, of Irish descent, and a mother of five children. When she consulted me, about the first of August, she was suffering with nearly constant bleeding, the blood being mixed with an offensive matter. Her digestive and assimilative functions were not good, and she was badly

nourished; she was losing flesh rapidly, and her general appearance indicated approaching cachexia.

I concluded, from the history she gave me of her trouble, that the disease began from twelve to eighteen months before I saw her. Upon examination I found carcinoma of the cervix uteri extending up the endometrium, but not involving the vagina or any of the uterine adnexa. The uterus was in normal position and perfectly movable, and no enlargement of pelvic or other glands could be detected. I did not believe all the disease could be removed except by total extirpation of the uterus, and advised her to have the operation done as soon as I could succeed in temporarily improving her local and general condition. She lost but little more blood, and by the first of October looked and felt much better, and there was hardly any further extension of the cancer.

She was prepared for the operation by being well purged, carefully bathed, and the vagina washed out with two gallons of hot water. The hair was cut from her pubes, and the parts washed well with ether, and a 1–2000 solution of bichloride of mercury. The instruments, sponges, etc., were prepared with all the aseptic care that should govern us in doing successful abdominal surgery. I was assisted in the operation by Drs. H. H Grant, J. B. Marvin, J. M. Matthews, H. Orendorf and F. C. Simpson. The water was boiled, and the instruments and sponges were put by the nurse in weak carbolic acid solution. Chloroform was administered and the operation done after the following fashion: The woman was put in the exaggerated lithotomy position, and the neck of the uterus exposed by a Sims' speculum and retractors, and drawn to the vulva with a heavy vulsellum forceps. The vagina was cut away from the cervix at a distance of about one-fourth of an inch from its attachment, and two or three small bleeding arteries secured by catch forceps. Further dissections posteriorly and anteriorly were made with the finger. The pouch of Douglas was first opened and all posterior attachments of the uterus rapidly separated; then the uterus was carefully dissected from the bladder, great caution being

observed to prevent wounding this organ or the ureters. Finally, all that held the uterus in position had been divided except the folds of the broad ligaments. The index finger was now hooked well over the left ligament and it was secured at a distance from the uterus by a catch forceps of my device, which I here show you. The right ligament was clamped in the same way. Both ligaments were then divided with the scissors near the clamps, and the uterus, ovaries and tubes were pulled away through the vulva.

The uterus was not inverted, and was removed in just twenty minutes. To prevent the possibility of hemorrhage, all bleeding surfaces or points were caught in catch forceps, so that when the operation was done eight pairs were left in the vagina. She did not lose more than one or two ounces of blood during the operation, and none after it. The small forceps were removed in twenty-eight hours, and the two large ones, clamping the broad ligaments, were removed in fifty-two hours. A small pledget of sublimated cotton was introduced into the vagina to hold the forceps apart and to aid drainage, and the vulva was well covered with absorbent cotton and a T bandage applied. No sutures were used to control hemorrhage or to unite surfaces, and the vaginal vault was left open. The cotton was removed from the vagina when the small forceps were taken off, and it was subsequently used only as a dressing over the vulva. The discharge of necrosed matter, which had been destroyed by the forceps, was rather profuse and offensive for a few days, but after a week it had nearly ceased and was not at all offensive in odor. No vaginal washes were used, but the dressing was removed twice daily and the external parts carefully cleansed. She was allowed to lie on her back or sides, as she preferred, and her water was drawn for one week. Her bowels were moved on the sixth day with sulphate of magnesia, and moved every day or every second day afterward. She had beef peptonoids, beef tea and mutton broth for three or four days, then she began to take milk and a little solid food, each day increasing the quantity, and after the eighth day she took

house diet. She suffered two days from the presence of the forceps, and for two days more from an irritability of the bladder. She was given during this suffering one-sixth of a grain of morphine two or three times daily. Her pulse after the operation and during the first day was sixty beats per minute. It then ranged from sixty to ninety, seldom getting above seventy-five. Her temperature reached nearly 101° on the second day, probably caused by the local annoyance and pain from the clamps. It then ranged from 98° to 100°. At no time was there any shock or sepsis, and she made an uninterrupted recovery. She was out of the bed on the 15th day, and left the Infirmary on the 19th day.

The vaginal vault had perfectly united at the end of one week. I have examined her several times since she left the Infirmary, and can detect no evidence of any return of the disease. Her general condition and appearance, and all her functions, had improved about twenty-five per cent. at the end of the second week, and she has continued to get better; in fact, she looks and feels perfectly well, and is going out on the street, and is attending to her domestic duties.

I interdicted sexual intercourse for three months, but probably this precaution is not entirely necessary, as there has been neither pain nor tenderness, on pressure, after the third week, in the vagina or in the pelvic or abdominal cavities.

A careful microscopic examination of the specimen removed was made by Mr. Simon Flexner, who reports as follows:

LOUISVILLE, KY., Nov. 3, 1888.

My Dear Doctor:

Herewith I beg leave to submit a report on the examination of a specimen handed to me. The specimen consisted of uterus, tubes and ovaries, just removed. The uterus had suffered marked change in configuration. The cervix was changed most, and was the seat of evident degenerative change.

The degenerative process could be traced by the unaided eye through the cervix and about one-half the length of the

fundus, where the tissue had a more healthy appearance. This limitation of degenerative process was subsequently confirmed by microscopical examination, as will appear. The tubes were apparently in a healthy condition, and the ovaries presented no abnormal features, save a few cysts.

On microscopical examination, the growth involving the cervix proved to be adeno-carcinoma. As before indicated, the new process extending into the body of the uterus disappearing about its center. In the mucous membrane of this portion there is considerable hyperplasia of the normally present spindle cells, and foci of round cells are occasionally observable. The glandular structure, however, appeared quite normal. Microscopical examinations of one ovary, at the point where it is attached to the tube, shows no degenerative change. Some connective tissue proliferation had taken place. Beyond this I could observe no change.

The tubes were not examined microscopically.

Pieces from which sections were made, were immediately removed and hardened in alcohol. Very truly,

SIMON FLEXNER.

Asepsis, or perfect surgical cleanliness, should be enforced in every detail of the operation. Weak solutions of disinfectants may be used, but I doubt their efficacy, and strong solutions are positively poisonous. I believe the success of vaginal hysterectomy depends largely upon absolute surgical cleanliness, rapidity in operating, and a perfect hemostasis. When the operation is prolonged, and the woman is kept for one or more hours under the influence of an anesthetic, or loses much blood, she is in relatively greater danger of death from shock or sepsis. By the use of clamps to control all hemorrhage, the *technique* of the operation is so much simplified and improved, that the uterus, etc., can be removed in from ten to twenty minutes, and the loss of blood is no longer an important factor. The clamps also afford an excellent means of drainage, and do away with the necessity of a drainage tube. But if we follow the *technique* of Schroeder,

Martin, and others, and use sutures to control hemorrhage, and to unite the vaginal and peritoneal surfaces, or to close the vaginal vault, it will require from one to two hours to complete the operation, and the hemostasis is not so perfect. Results have shown that it is best not to close the vaginal opening; and experience has demonstrated that the supposed dangers resulting from intestinal or omental protrusion in the vagina, are mostly imaginary; at least they are reduced to a minimum.

I believe that the mortality in vaginal hysterectomy can be reduced as low as that in ovariotomy, but I beg to repeat what I have said at another time: "That it is positively criminal for any one to attempt to extirpate a cancerous uterus, or to do pelvic or abdominal surgery until he learns the anatomy, physiology and pathology of the pelvic and abdominal structures, and knows how to make a correct diagnosis where it is possible to do so; he should also know the general principles and the details of the most approved *techniqne* for such operations." Nor should the uterus be removed if there is any evidence of cancerous cachexia, or if, in a careful physical examination, any structure outside of the uterus in the pelvic cavity is found to be infected. A microscopical examination of a part of the removed tissue by an experienced microscopist and pathologist, may aid us very much in diagnosticating cancer of the uterus in its incipiency, when we may expect the best immediate and subsequent results from vaginal hysterectomy.*

*On June 1 there is no return of the cancer, and the woman weighs ten pounds more than at any time during her past history and feels perfectly well in every way. She has sexual connection regularly but does not experience any pleasurable sensation.

CERTAIN FORMS OF MENORRHAGIA AND TREATMENT OF THE SAME.

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Menorrhagia is generally understood to mean either an abnormal increase in quantity of blood lost in the normal menstrual period, or an undue prolongation as to time, the total amount of blood lost in either case being much beyond what it should be for the individual. In the majority of cases both of these elements are present; the flow is relatively too free and unduly prolonged.

The knowledge that menstruation is a recurring and necessary phenomenon in the female during the period of sexual activity is a fact as old as the race.

While it is true we have much more knowledge than was possessed by the profession previous to the studies of Bischoff, Pfleüger and Robert Lee, and others of more recent date, yet many of the questions connected with the function are not so completely or clearly answered as is desirable. The doctrine enunciated and maintained by these writers and accepted by the profession, that periodical ovulation, or the development and discharge of ova from the Graafian follicle, accompanied and determined the menstrual flux, must in a light of fuller knowledge be revised.

First, ovulation does not always accompany the menstrual flux, but may precede or follow it.

Second, following the removal of both ovaries, whether from disease or by Battey's operation, the menstrual flow does not in all cases immediately cease, but recurs at more or less irregular intervals for a considerable period, sometimes for several years.

More recently Lawson Tait has maintained that the fallopian tubes, and not the ovaries, determined menstruation, and the flow is induced by active movements of the tubes to grasp the ovary in the fimbræ, and, for this reason, has insisted that removal of the appendages is necessary to accomplish what Battey proposed when he evolved his original operation. Even this more radical operation does not in all cases immediately arrest the periodical flow. Dr. Mary Putnam Jacobi, in a series of elaborately written articles (*Am. Jour. Obst.*, 1885), maintains, as a result of careful study in a large number of living subjects, and many sections of the cadaver, at varying periods, menstrual and intermenstrual, that the womb is in a state of pre-menstrual progressive preparation for the flux or pregnancy, either of which may be considered the climax of preparatory effort. The flow having ceased, a period of post-menstrual retrogression follows until the womb reaches the minimum weight and vascularity of the quiescent mid-menstrual period, which state of quiescence constitutes only about one-third of the time between periods.

The pre-menstrual preparatory development, according to Dr. Jacobi, consists in "enlargement by growth of the periuterine and ovarian sinuses." "The essential and the efficient cause of the menstrual hemorrhage lies in the accumulation of blood in the periuterine and ovarian sinuses."

This accumulation is not a congestion. Up to this point the whole process is one of physiological preparation for the reception and development of a fertilized germ or ovum. She says: "When fecundation has not occurred, the growing endometrium arrived at a certain point of development, is then arrested by the non-expansion of the uterine cavity. The opposing surfaces of the endometrium touch, press

against each other; it exfoliates, laying bare the surface capillary loops, which break at some point, so that capillary oozing begins."

The foregoing studies and deductions harmonize thoroughly with the conclusions of Engelmann, Kündrot and more recently Johnstone,* that the endometrium is in no sense to be regarded as a mucous membrane, being devoid of basement membrane. On the contrary, it is an adenoid or glandular structure, the glandular follicles and the intervening space being sparsely covered with rounded cells, which have only a remote resemblance to epithelium, between which the glandular follicles penetrate.

The dominating and controlling influence which the nervous system maintains over all the functions of the body must not be lost sight of in the consideration of menstruation, either from the physiological or pathological standpoint.

If, at the proper age, none of the signs of puberty appear, and none of the peculiar nervous and circulatory disturbances described, as the menstrual molimen assert themselves, the ovaries will be found absent or undeveloped. If the accessory organs, breasts, pendulum, etc., are developed, and the menstrual molimen is absent or feebly expressed, the vagina will be either absent or short and narrow, and the womb either absent or rudimentary. If the molimen is well pronounced, together with the evidences of well-developed womanhood, and there is no flow, there is either atresia vaginæ or absence or slight development of the uterus.

The first step in the processes which inaugurate the menstrual flow is development of the ovaries and the ripening and discharge of mature ova. Accompanying, or accessory, to this is the periodical enlargement of the uterine and ovarian sinuses, vaso-motor impulse, filling the sinuses, and, lastly, the visible flow, most likely as described by Dr. Putnam Jacobi.

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*Trans. British Genecology Association, vol. vii., No. 7.

It does not necessarily follow that the menses would immediately cease to appear after the removal of the ovaries, even on theoretical grounds. The vaso-motor and trophic cyclic impulse once thoroughly imparted to the organism, would dominate the uterus, in the usual fashion, and the flow would appear at intervals of more or less regularity, for a considerable period; the impulse growing weaker, the pre-menstrual trophic charges would not be sufficient to provoke the flow, and it would cease to appear.

These trophic changes, and the hyperæmia, and attendant flow, amounting in all to only a few ounces, when the womb, ovaries, appendages and accessory organs are healthy, may, under certain circumstances, be very much in excess of the normal quantity, and unduly prolonged. The only wonder is that enlarged sinuses, permanent hyperemia and excessive flow does not oftener follow or replace the normal physiological recurring hyperæmia.

Exposure to cold, excessive exertion, or fatigue, worry and excitement during a menstrual period, may develop the necessary excessive engorgement: a repetition of these events in a careless or reckless subject, the morbid condition becomes fixed on the victim. This type of cases are frequently encountered in strong and plethoric young women, who think they can endure all things, and survive any imprudence.

Occasionally, in delicate subjects, with feeble blood-making powers, the same imprudence will develop menorrhagia; but in this type we are far more apt to have, after one or two excessive periods, dysmenorrhœa, with scanty flow.

In young married women, during the child-bearing period, by far the most frequent cause is imperfect evolution of the womb, following an abortion, or labor at term. Whatever the cause producing the sub-involution, whether rapid and successive child-bearing, too early rising after parturition, rupture of the cervix, imperfect removal of secundines, forceps delivery, with rupture of perineum or dragging down and dislocation of the pelvic facia, suppression of the lochia, sep-

sis; anything which causes determination of blood toward the pelvic organs, will give rise to that condition we all recognize as sub-involution. A heavy womb enlarged in all dimensions, a patulous gaping os, often with mucous membrane everted and exhibiting fungosities, the sound penetrating to a depth of 3½ to 5½ inches, from a half to one and a half inches deeper than we would expect in metritis, where the uterus appeared to be of the same size as determined bi-manually.

The condition of the womb is one of softening and relaxation of the muscular fibres, which are infiltrated with fat, sinuses enlarged, blood-vessels of the endometrium very much enlarged, requiring only the additional vascularity of the menstrual molimen and incident development to produce a flow exceeding the natural amount, and often-times amounting to alarming hemorrhage.

The treatment of these various conditions producing menorrhagia, is either general or local.

In young girls, where there is a full habit, and the menorrhagia has followed exposure to cold, excessive fatigue, dancing, long walks, horseback exercise, etc., during a period, simple hygienic treatment, of plain food, absence of excitement, fresh air, loose stays, well protected body, thick shoes, regular bowels, occasional salines, and the supine position during the menstrual period, will, if faithfully carried out, in a surprisingly short time effect a cure in the vast majority of cases. When this fails, and local treatment is required, the application, once a week, to the endometrium of Battey's solution of iodine of carbolic acid, together with tampons of boroglyceride and glycerine, equal parts, renewed every second day, should be tried.

Shop-women, particularly those who have borne children, in consequence of constantly standing upon their feet, even during the menstrual period, suffer from engorgement of the womb, menorrhagia, and more or less leucorrhea. In this type, careful tamponage of the vagina, with glycerine and iodoform cotton, using just a sufficient amount to slightly

elevate the uterus, together with at least partial rest during the menstrual periods, will usually effect a cure, unless the nervous system is undermined and general nutrition has suffered considerable impairment. If so, a season of complete rest, tonics, and general faradization may be required to perfect the cure.

In cases of sub-involution following miscarriage or childbirth at term, a careful examination should be made to determine the local condition, as a proper selection of procedure will determine whether the cure shall be speedy and safe. If a laceration of the cervix is discovered, and is extensive, it should be closed. In some cases a careful curetting should precede the operation by from five to seven days; especially should this be done in case the laceration is of long standing and the menorrhagia has followed a more recent miscarriage. In recent cases, where the laceration has resulted from an instrumental delivery, followed by arrest of lactation and tardy convalescence, the simple operation of trachelorrhophy is followed by involution and cure.

The vast majority of cases presenting sub-involution and menorrhagia, will be found, on examination, not to have suffered laceration of the cervix; but we find that condition typical of sub-involution. Relaxed muscles gorged with fat, enlarged sinuses; blood-vessels of the endometrium enlarged, with thin walls; bleeding under the slightest provocation, the mere passage of a sound being sufficient to start more or less free oozing. If the organ is fairly movable, without much tenderness of surrounding tissues, the case is much simplified.

A certain proportion of these cases may, in time, spontaneously subside, and a certain number may be aided to recovery by internal medication, iron, arsenic, ergot, etc., together with proper hygiene. But in the majority of cases, without local treatment, a state of general anemia with hyperesthetic hysteria will ensue, and the restoration to health will be much retarded.

The choice of method in the local treatment is a matter of much importance. The philosophy underlying all treatment is to give increased tone to the muscular structure, remove fungosities or fragments of secundries, and by obliteration, or contraction of calibre, diminish the passive hyperæmia of the endometrium.

The curette, first given to us by Recamier, and indorsed by Sims, has, after a season of comparative neglect, in recent years been the chosen method of treatment. If this method is adopted, it will be found that the dull curette of Thomas is only suitable in a minority of cases. It is true, the sharp curette in careless hands may do damage, though, as Dr. Gill Wylie* says; "A man who can not use the sharp curette without inflicting injury, had best not undertake the treatment at all."

The application of the fuming nitric acid to the endometrium, so strongly commended and successfully practiced by the late Lombe Athill, is, when properly applied, a safe and speedy method of cure in many cases. If only partially or inefficiently used, it will cause further determination of blood to the uterus, and the tendency to hemorrhage will be increased. When properly applied the acid destroys by erosion and thrombosis, quickens the circulation in the deeper structure of the uterus, stimulates the muscles to contract, hastens absorption of fat and other effete material, and the womb is soon restored to its proper size and proportions.

The thorough use of the curette, and the proper use of the acid, produce in their mechanical and other effects on the endometrium an almost identical effect. With better, more available and safer methods, I think the use of the acid should be abandoned.

By the curette, adherent residual masses of placenta are removed, fungosities and small sesile growths of the endometrium scraped away, and varicosities destroyed; but unless there results a stimulating tonic effect upon the muscular structure and deeper circulation of the uterus, the fungosities

*American System of Gynecology, Vol. I.

will surely be reproduced, the hemorrhages will again recur, and the operation must be repeated again and again.

For the past two years I have treated all cases of this character coming under my observation, after the method devised and practiced by the late Dr. Taliaferro,* of Atlanta, viz., by the application of the intra-uterine tampon.

Of course, Sims and many others had used small tampons of cotton lint, etc., charged with various medicinal agents, passed up and left within the uterical cavity. But Dr. Taliaferro was the first to advocate the application of the tampon, firmly packed within the uterus, to promote disgorgement of vessels, quicken absorption, restore healthy tone to the uterine structure, much as we bring about repair by bandaging varicose ulcer of the leg.

As Dr. Taliaferro,† in another communication, truly says:

"As a therapeutic measure, the intra-uterine tampon is simple, safe and marvelous. With the proper observation of the contra-indications to all intra-uterine applications, the remedy is perfectly safe. It, of course, should not be used when there is the vestige of inflammation in the peri-uterine structure.

"So long as there is sufficient oozing of blood to saturate the tampon, it is removed and reapplied daily; otherwise, it remains for two days.

"If iodoform is used with the packing, as should always be done, the patient is secure against sepsis, the dressings removed being clean and free from odor, though it remain for two or three days."

Dr. Taliaferro's method is to place the patient in the knee-chest or Sims' position; as a rule the knee-chest is to be preferred. The perineum, then firmly lifted or retracted by Sims' speculum, is held by an assistant; a strong tenaculum, or, what is better, a spring-catch vulsellum forceps, is used

*Transactions Georgia Medical Association, 1886.

†Atlanta Medical and Surgical Journal, October, 1886.

to seize the anterior lip of the womb, is drawn down toward the vulva and firmly held by the assistant, or the left hand of the operator.

The tampon, which should be made of a roll of sample or absorbent cotton, drawn out and rolled between the hands until moderately firm, is wrapped spirally with a sewing thread and tied at the lower end; about four to six inches of the thread being left to facilitate extraction. Into this tampon iodoform is thoroughly rubbed, or, what is better, it is dipped in a saturated solution of iodoform in ether, and the ether allowed to evaporate. I generally keep, inclosed in a canister, a supply of the rolls, of various sizes and lengths, already prepared by dipping and drying.

The patient being in proper position, as already described, the tampon is seized at its distal extremity by a slender pair of dressing forceps (I generally prefer Thomas' intra-uterine), and carried through the cervix and to the fundus uteri; the blades are then slightly separated and withdrawn a couple of inches, when the tampon is again seized and another section crowded in; this is repeated until the entire uterine cavity is snugly packed, which may, in some cases, require two or three rolls. Powdered iodoform is then dusted over the cervix and vagina and a tampon of glycerine and iodoform is passed up to the cervix; back of this is placed a moderate tamponage of cotton, unless there be at the time a very free flow of blood from the womb, which it is desirable to stop at once, when a firm vaginal tamponage will be required to supplement and reinforce the intra-uterine tampon.

Under the firm pressure of the intra-uterine tamponage, those tissue changes of construction and destruction and absorption go forward, whereby the womb reaches a normal condition. When the muscular tone of the womb has been restored the tampon will no longer be tolerated, but will be forced out. A light glycerine and iodoform vaginal tampon should be worn for a week or ten days after the discontinuance of the intra-uterine packing. It is best to confine the patient to bed, at least for the first few days, during the use

of the tampon, and to the house, and very moderate exercise, the whole period of treatment; otherwise, development of hematocile or localized peritonitis may force a discontinuance of the treatment.

At the October meeting of the *Societe Medicale de Geneva*, Professor Vuillet presented a paper on "Progressive and Continuous Dilatation of the Cervix and Uterine Cavity," by cotton tampons, for occular inspection and diagnostic purposes, using small pledgets of iodoform cotton, from the size of a pea to an almond. He carries these tampons up to the cervix with slender dressing forceps, and with a stiff metallic rod forces the cotton into the cervical canal, continuing the dilatation, if necessary, with bougies.

"He plugs the uterine cavity as a dentist plugs a carious tooth. These are renewed at the end of twenty-four or forty-eight hours." Vuillet only makes use of this method when it is necessary, or any benefit to the patient. "When the introduction of the finger or curette suffices for the treatment, dilatation is pushed only to the extent necessary for that purpose," etc.; showing that this distinguished teacher did not adopt his treatment as a curative measure, or perceive its value for this purpose.

It is mainly to again call the attention of the profession to this wonderfully effective treatment, as practiced by Dr. Taliaferro, that I have written these lines. I am satisfied that those who are making opinions and authority for the present generation, and history for the future, do not fully appreciate this resource, or it would find an abiding place among the resources of gynecology.

Since this paper was written, I have read with some interest an article, by Dr. Eugene C. Gerhung,* of St. Louis, Mo., presented to the American Gynecological Society, September, 1888: "Repression of Menstruation as a Curative agent in Gynecology." I have been very much interested in his reasoning and conclusions, which may be summarized thus: That in a case of menorrhagia, where there

*American Journal of Obstetrics, November, 1888.

can be no doubt that the great blood losses are surely undermining the patient's health, the physician is not only justified in endeavoring to diminish the amount of blood lost at the next menstrual period, but, even, by his art *prevent the flow altogether.* I confess I was a little disappointed when I read his method and the means by which he proposed to accomplish these beneficent results, which was tamponing the vagina with absorbent cotton, wrung out of a one or two per cent. aqueous solution of alum, packed bit by bit, so as to make a tight vaginal tampon; under this plan the loss of blood is insignificant. As to the intra-uterine tampon, he says, in a given case: "The intra-uterine tampon made matters worse." If Dr. Gerhung will begin his treatment by pushing his first tampon (after the manner of Dr. Taliaferro), firmly against the fundus, and continuing until the womb is entirely filled with elastic aseptic cotton, and then place the vaginal tampon, he can control the oozing, however free it may be.

As to the correctness and propriety of his proposition to restrain the menstrual flow in the sense of almost arresting it, temporarily, there is no question of doubt. When I begin the use of the intra-uterine tampon, I do not consider the approach of menstruation as any bar to its continued use, but go forward with the method until I have accomplished that for which I have inaugurated it.

TWO CASES OF VICARIOUS MENSTRUATION,

In One of Which Was Floating Kidney.

By De Saussure Ford, M. D.,

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Case I.

Floating Right Kidney, with Vicarious Menstruation by the Kidneys.—Mrs. ——, aged thirty-two, tall and slender, began her normal menstruation at the age of fourteen. Has two daughters, ages ten and eight, and one son, age two years and four months. Has never had any abortions or miscarriages. Two years after birth of child, now eight years old, she began experiencing spinal tenderness, from occiput to sacrum, and four years after had an attack of acute nephritis, after which the vicarious menstruation began, and continued regularly until conception with last child, since birth of which she menstruates regularly. It appeared that, during the six years before the birth of last child, her husband and herself had resorted to measures to prevent her conception, and her spinal irritation developed to extreme spinal hyperesthesia, with hysterical attacks. The right kidney was discovered as loose, about three years before last conception.

I prevailed on her and her husband to allow conception, saying that it might act as an internal splint, for about six

months, for the displaced kidney, and might have some effect upon the vicarious menstruation. She has not had any vicarious menstruation since the birth of last child, and experienced no pain in right kidney, still floating until six months ago; there is *occasional* manifest swelling of it, and always pain after walking. Her bowels are never constipated—usually a daily evacuation from them. Her appetite is excellent. At present there continues the exquisite universal spinal tenderness, which is occasionally benefited by dry cups, electricity, and massage; but there have recently developed head symptoms—rush of blood to head, with severe cephalagia; this since birth of last child. During these attacks she is hysterical, imagining that she sees her own coffin, and remarks upon the details of her funeral; in short, she is a confirmed invalid until some of the family become sick, when she runs up and down stairs (her husband has been obliged generally to carry her up and down them, on account of pain in back and kidney), forgetting her aches and pains.

The urine, examined very often during the interval between her vicarious menstruation, has never shown any traces of disease of the kidney, and since it has ceased there is nothing to indicate disease of those organs.

CASE II.

A Case of Vicarious Menstruation by the Lungs.—Miss ——, aged twenty-five, brunette, commenced normal menstruation at fifteen, and continued until she was nineteen, when she "caught cold" during the menstrual epoch. She has ever since, with occasional *slight* "shows" from the internal generative organs, regularly every twenty-six days, experienced, for three or four days, pulmonary hemorrhages, sometimes abundant and exhausting, at other times, more scant, and for a longer period. When this first began, it was ushered in by violent hysterical convulsions; but for the past two years these have not occurred. Her lungs have been carefully, and very many times, examined during the intervals between the hemorrhages, and nothing abnormal has ever been discovered.

During the past two years she has suffered with two pelvic abscesses, which have discharged through the vagina, without surgical aid.

Upon vaginal examination, digitally and with speculum, nothing more than a virgin's uterus is found, except that the channel through the cervical canal will not admit more than an ordinary-sized silver probe of the surgeon's pocket case. At one time, two years ago, I introduced a sponge tent, but its dilatation ended in repeated hysterical convulsions, which were most alarming, and the operation has not been repeated. The patient is not emaciated; indeed, up to two months ago she was remarkably well, riding into the city and walking about the grounds of her home, when she sustained an attack of "continued remittent fever" (Sternberg) which lasted three weeks; but she is now up and interested in her domestic life. She is an orphan, and is supposed to be hereditarily predisposed to tubercular disease; but being an orphan, I have failed to be satisfied on this point. While thinking so, a distinguished friend was consulted in regard to normal ovariotomy, which he advised; but I did not coincide, believing that, if the operation was performed, it might stop the pulmonary vicarious hemorrhage, which seems to be innocent, and light up the heredity. I have been unable to determine the cause for the development of the two pelvic abscesses, which, however, were preceded for a week or more, by decided swelling in the ovarian region, as well as a doughy feeling in the vagina, but still the vicarious menstruation goes on. Fearing ovarian or tubal disease, an exploratory operation has been urged, but to this she will not consent.

Her constipation will not yield to mild remedies nor to diligent massage, and only the most decided vacuants will suffice.

In looking up the bibliography of the subject of "Floating Kidney," it is discovered that little satisfactory practical result has followed the treatment. DaCosta says: "We never find any disturbance in urinary functions, nor, in fact, except a disagreeable feeling in walking, does any real inconvenience

result, save in those cases in which the movable kidney has become painful, which is most apt to occur after violent exertion. . . . The right kidney more frequently is in trouble, and women more liable than men."

Niemeyer writes: "The kidney lies embedded in loose areolar tissue; its vessels are elongated, and have a sort of mesentery formed out of the reduplication of their peritoneal coat. . . . Are most common among women whose abdominal integuments have become greatly relaxed by repeated child-bearing, and may result from violent concussion of the body, or a fall from a great height."

Condensing from the "Classic Encyclopedia" of Pepper, vol IV, p. 21, *et seq.*, we note his saying: "The right kidney is more movable, less frequently observed in this country than in Germany, where the severest labor is carried on by women, and is caused by an unusual laxity of connective tissue. From the position of the right kidney—the contiguity of its superior extremity in front of the liver, and its slightly higher place in the abdomen, it appears to be more influenced by the pressure of corsets, or strings. The movements of respiration, especially when reinforced by the forced inspiration and compression of the abdominal viscera, accompanying violent exertion, appear to assist in the dislodgement already favored by the pressure of the girdle." . . . According to Müller Warnek, he has recorded the frequent coincidence of flatulent dyspepsia and dilatation of the stomach, depending on retention, and its consequent fermentation, in connection with the movable kidney; but it is quite as likely that the dragging of the pedicle may have a remoter effect through the renal and sympathetic nerves."

Paul Mehaus, of Berne, has suggested a double hernia truss with a vertical steel arm with a pad, to retain the kidney in position, which may be removed at night. My patient will not consent to removal; so she must continue, with all the train of nervous disorders which Pepper so intelligently depicts.

In regard to the literature of vicarious menstruation, it will suffice merely to cite some few authorities. I am surprised at the present skepticism of the brilliant Tait, who still is doubting, and I wish he could study the subjects whose cases are reported.

I refer to Vol. I, Gynecological Transactions, pages 135–136, by Parvin.

Diseases of Women, Barnes, p. 154.

Diseases of Women, Thomas, p. 417, 1874.

Southern Medical and Surgical Journal, Augusta, Ga., Vol. VI, 1850, p. 445.

Southern Medical and Surgical Journal, Augusta Ga., Vol. XII, 1856, p. 358, *et seq.*

Southern Medical and Surgical Journal, Vol. VIII, N. S., 1852, p. 660.

Churchill, 1857, p. 159, *et seq.* 1847, p. 99.

Emmet, 1880, p. 196.

A REVIEW OF THE TREATMENT OF UTERINE DISEASES BY ELECTRICITY.

By J. R. Buist, M. D.,

Nashville, Tenn.

Gentlemen of the Association:

We meet together here, it is presumed, for the high purpose of mutual improvement in the knowledge of that department of the healing-art with which we are especially identified. We hope, by the presentation of facts and observations, by the interchange of thought, and especially by the review and analysis of medical literature, to keep ourselves abreast of the advancing column of scientific medicine, marching to the relief of human suffering. To contribute my humble quota to this fund, I beg to submit some remarks upon the subject of electro-therapeutics in the sphere of diseases of women. In doing so, I shall attempt neither to eulogize its claims nor to detract from its alleged value and importance; but simply to present, as correctly as possible, its position in the professional mind of to-day, at home and abroad, and to compare the results of this method with its rival surgical procedures in some of the affections of the uterine system.

To the familiar student of gynecology, the past thirty-five years present astounding progress in teaching and practice; investigations have been active and laborious; novelties and innovations have teemed from all quarters, and the results

attained have been unexampled. It was at the commencement of this period that the zealous labors of Scanzoni, of Courty, of James Y. Simpson, and Marion Sims were collecting the knowledge from which has since been formulated the present department of gynecology. Many schools have risen and passed away; many phases of theory and practice in uterine pathology have served their day, and now we live in an era when the landmarks of our student days are destroyed; when one hears little of these great names, or of their valuable labors, and, like the Athenians of old, we seem to live only "to hear or to tell of some new thing." In our day operative measures upon the pelvic viscera have attained their highest development. In fact, the conservative portion of the profession believe it is pushed to an extreme. As Mr. Tait wittily said, with many it is, "Here's something; let's have an operation."

The genius of Battey first demonstrated the possibilities of ovarian extirpation for remote and reflex troubles; and, although at first received with distrust and contempt, at last has commanded just recognition all over the civilized world. Like a pebble thrown upon a quiet lake, its circling ripples expand until they now touch the remotest shores.

Along with this marvelous progress in surgical methods comes the renewed interest in electro-therapeutics as applied to uterine diseases, and, as the adherents of this practice claim, with results positive, satisfactory, and even wonderful. If we read only the accounts of the electro-therapeutists themselves, we shall almost be tempted to believe that the sufferings of women will soon end; and if we listen to the ridicule and contempt of the strictly surgical school, we will think this agent a veritable humbug.

Electricity, as is well known, is no new remedial agent. Its history presents a checkered course of praise and abuse, of success and failure. Leaving out of consideration the centuries preceding the discovery of galvanism, when the torpedo-fish, the magnet, the electric machine, and Leyden jar were applied in a loose and irregular manner to the cure of

diseases, we come to the introduction of contact or chemical electricity, now known under the terms galvanism and voltaism, when we find that the great Humboldt published a work on electro-therapeutics. For thirty years after this there was no real advance in the knowledge of this agent as a remedy. Charlatans and quacks hawked its claims on the streets, and, outside of a few scientific men, the profession allowed it to fall into disrepute. Upon the discovery by Faraday of the induced current, another impetus was given the study and application of this remedy, and the discussion between the friends of the constant and the interrupted currents waxed very hot, Many improvements were about this time added to the batteries for medical use, and their cost materially lessened.

The investigations of Duchenne, Du Bois Raymond, Moritz Meyers, and Remak put the subject of electro-therapeutics upon a far more scientific basis, and awakened in the medical profession over the world a lively interest. Many works were published, both philosophical and practical, and by 1870 there was hardly an office in city or country where a battery of some sort or other did not form a part of the doctor's outfit. These batteries, many of them nothing more than toys, soon got into the hands of female doctors, irregulars, and invalided laity. The result was that, in consequence of the little success the ordinary physician had with this agent, the care and trouble required to keep the machines in good working order, the profession by 1885 had either abandoned the use of electricity or looked upon its employment with great distrust.

About this time, along with improved battery construction, and especially with the addition of an efficient means of measuring the dose or actual current strength by a properly constructed galvanometer or milliampéremetre, as also the further study and scientific application of Franklinism or static electricity in therapeutics, the whole subject of the remedial powers of electricity has been set in a more favorable aspect before the profession than at any previous era. But, more

than anything else, the concentration of thought and attention to this agent by that gifted Frenchman, Apostoli, and his great and admitted success in the treatment of endometritis, subinvolution, pelvic inflammatory products, and uterine myomata, has given an astonishing impetus to the study of this remedial agent, filling the medical journals for the last three years, in all parts of the world, with its literature. Clearly, the unbiased intelligence of the profession of to-day demands a respectful hearing of its claims, and commends it to still further investigation.

The gynecologist of the present day employs electricity under several forms and selects a variety of methods in its application to each particular case and form of diseased structure.

For instance, the employment of the electro-cautery, which, although perhaps not as much in use now as it was some years ago, is recognized as a valuable substitute for the knife or the *écraseur* in cases where hemorrhage is to be dreaded. This cautery is produced by a constant current generated by large cells, and being conducted through a terminal loop of fine platinum wire; by the resistance met with in this wire it is raised to a white heat. Another mode of using electricity which is now of very great assistance to the gynecological surgeon, and developed by the same process as the preceding, is that of illuminating cavities by the incandescent light. In operations within the vagina or in laparatomy, the surgeon possesses the power of ocular demonstration secured by no other means.

I am not aware that any application of static electricity, known generally under the name of Franklinism, has as yet been made in gynecological practice, nor do I think it would possess any advantage over the other forms.

The induced, interrupted, or faradic current has a limited one in pelvic diseases, although, according to some very competent electro-therapeutists, the value of this almost equals that of the constant. It is doubtless more in vogue for the treatment of uterine affections than a few years ago. The

nature of the induced current is to stimulate and invigorate weakened muscle and nerve tissue, and doubtless much can be effected by bringing it to act on the relaxed uterus and vagina, the uterine ligaments and dilated blood-vessels.

We come now to galvanism proper, which, as you all know is, at least theoretically, a constant and continuous current, generated from a connected series of voltaic cells, so as greatly to increase the electromotive power of the current, and, as it passes through the tissues, it gives no sense of shock, provided the opening and closing of the current is properly performed.

This is the current of most extensive range in the treatment of uterine diseases, and which has to its credit most of the benefits that have followed the electric treatment. The current is sent through the diseased structure or tumor, by means of variously shaped reophores, according to the mode of action desired, for from five to twenty minutes at a time, and again repeated at longer or shorter intervals. The effect of these often repeated *séances* is to soften hardened tissue and inflammatory hyperplasia, to diminish the size of tumors composed of fibrous tissue, and in some way to modify the nutrition and circulation in the living tissue. The explanation of these alleged results and the nature of this *modus operandi*, has been attempted by the electro-therapeutists; but, while they have given some little positive proof, they reason more from the analogy of the effects produced in inorganic chemistry in the process known as electrolysis and electroplating. The action of galvanism upon water, or any other chemical fluid, in decomposing it into its elements and attracting one set to the positive and another to the negative is believed to take place, virtually, in the living tissue, due allowance being had for the increased resistance to the current. It is said that in electro-puncture the oxygen and acids collect at the positive and the salines and fluids at the negative. That in the use of the soft-covered electrodes applied to the surfaces, it is found that the fluids tend to pass to the cathode. Now they claim that, if such a change, however slight,

may be induced in the molecular constitution of a tumor or any other abnormal tissue, by a current passing a few minutes, the frequent and repeated application of this force must in the end greatly influence the interstitial nutrition of the part. Another practical fact that further corroborates this theory is, that the positive pole, applied intra-uterine, proves hemostatic in bleeding from the uterus, while the negative has no such effect. The question whether the galvanic current can directly act upon the cells of the various living structures, and thus influence their growth or decay, is not yet settled among these specialists.

We, however, do not think it is fair to infer that the galvanic current produces a similar effect chemically in its passage through living tissue as it does on organic or inorganic compounds in solutions. The chemical and calorific action of the current is limited to the surface or to the tissue adjoining the electro-puncture. Neither will the doctrine of electro-osmosis apply. All that the electro-therapeutists can affirm in reason is, that there is some stimulation imparted by the current, in consequence of which a physiological change is set up in the tissues, which eventuates in absorption and resolution of abnormal conditions.

For relief of stenosis of the uterine canal, accompanied with flexion, the employment of the constant current has given good results. Twenty years ago, Marion Sims placed before the profession his operation of widening and straightening the canal by two incisions; one at the point of flexion, usually the os internum, and the other through the posterior lips. This plan was fully discussed and tried by the profession, and for some years has been pretty well abandoned. Then followed the use of gentle dilatation, after Peaslee's plan, and this seems now to be falling into forgetfulness. In place of either of these modes, the electro-therapeutist employs an insulated electrode with an olivary platinum point for the negative pole, this being carried into the cervical canal while the positive is applied over the supra-pubic region. In this way is obtained the electrolytic action of the current

upon the contraction and the surrounding tissues, resulting in a softening and straightening of the canal. Dr. F. E. Bunts, of Cleveland, Ohio, in *Medical Record* of July 21, 1888, reports very gratifying success with this method.

The same writer, in the above-quoted article, highly extols the use of strong currents in membranous dysmenorrhea—an affection rarely cured by any means (whether medical or surgical) yet employed. The method of treatment is by intra-uterine application of the negative pole.

In the treatment of uterine displacements, a very wide field for any agent, the modern employment of electricity is to be compared to the old methods of replacement by the sound and bimanual pressure, together with a retaining pessary. These procedures are almost universally admitted to be but make-shifts, only palliative, as very seldom does a pessary effect any permanent cure.

Secondly, we may compare the value of this treatment to that of the surgical methods—first, of shortening the round ligaments, Alexander's operation; and also to the supra-pubic opening of the abdomen, and attaching the cornua of the uterus to the anterior walls of the abdomen by sutures. These are two grave and serious operations, that none but an expert surgeon will probably undertake, of course never free from danger even with the most approved asepsis, yet they may give radical and satisfactory cures in retroversion. Narrowing the vagina by surgical methods for support of prolapsus uteri, while not so dangerous, does not give as good permanent results as was anticipated. Now it is claimed that the use of the electric current, both the faradic and the galvanic, will correct these displacements in a manner free from danger, without any cutting, and with permanent results. Dr. Lapthorn Smith, of Montreal, in a very able article in the *American Journal of Obstetrics* for June, 1888, tells us "that electricity, especially in its faradic form, is the rationally indicated remedy in all forms of displacement." He points out that the uterine walls themselves are muscular, that the so-called ligaments contain mostly muscular fibre,

and that the chief support, the vagina, is a muscular structure. He further contends that displacements are the consequence of a relaxed and diseased condition of one or all the supports; that it is an admitted property of the faradic current to act as a stimulus and invigorator of muscular tissue; bringing it into exercise and restoring its normal tone. He reports his experience with this method as very successful. Dr. Engelmann, in the *Obstetric Gazette* for April, 1887, strongly indorses the electric treatment in uterine displacements. He, however, would not supplant the accepted surgical means, in many cases. From our study of the subject, we believe that electricity will be found a valuable agent in correcting displacements, versions and flexions, and that there will always be opportunities for its employment; but that in the large number of severe cases of retroflexion, the surgical methods will give the most satisfactory results, and are to be preferred.

The employment of electricity for the removal of the secundines and retained portion of placenta after abortions is strongly recommended by Dr. H. D. Fry, of Washington, in a well written article in the June number of the *American Journal of Obstetrics*. He employs the faradic for immediate and early removal, and the galvanic for older cases, applying the anode intra-uterine. His theory is that the secundines, being of lower vitality than the normal tissue, are acted on more energetically by the current. We fail, however, to see any real advantage of this method over dilating tents and the curette.

Of late years the subject of ectopic, or as it is now most commonly designated, *tubal pregnancy*, has engrossed the attention of the profession. The very grave nature of this condition and its heavy rate of mortality has justified almost any radical method for relief. As the diagnosis of this condition can be made sufficiently clear and accurate after the third month, interference by some operative procedure is perfectly justifiable even before rupture and impending death occur. The laparatomists are enthusiastic over the success attained

in the last few years under a well-conducted antiseptic operation, and well they might be. In all cases of ruptured sac and hemorrhage, nothing else but laparatomy is to be thought of; but in the event of the early recognition of tubal pregnancy it appears that the success attending the employment of electricity has afforded the advocates of this plan abundant reason for their faith.

That the life of the fetus in tubal pregnancy can be destroyed by the electric current passed through it, without damage to the mother, cannot be questioned—sometimes at one sitting, and at others in several applications. It is not a recently introduced mode of treatment, but since the improvements in employing electricity and the light obtained from experience, it now has the support of many able practitioners. The recorded cases also show that in the majority of instances the remaining tumor is either absorbed or becomes indolent and harmless. And, further, it can be said in its favor that should either a failure to arrest the growth or to obtain reabsorption occur, laparatomy can be at last resorted to.

The subject has been exhaustively treated in an article in the May number, 1888, of the *American Journal of Obstetrics* by Dr. A. Brothers, of New York, He has carefully collected and tabulated forty-three cases treated by electricity, along with the name of the operator and consultant, date of report, number of applications, results, etc.

Beginning with the case of Bachetti, in 1853, he comes down to his case in 1887. "From this test we see that of the 43 cases, 2 were treated by electro-puncture, 21 by faradism, 16 by galvanism, 2 by both currents, and 1 by Franklinism; in the remaining case, either faradism or galvanism was used, but the reporter does not specify which; 2 cases terminated fatally; the case of Braxton Hicks as the result of subsequent puncture of the cyst five weeks later, and hence the fatal result cannot be attributed to the electricity; and the case of Janvrin, in which hemorrhage was induced from a ruptured artery on the sac-wall, which had spontaneously opened nine days previously. This case should have been operated on by

laparotomy at first. In the cases of Mundé, Lusk, Gardiner, Chadwick, alarming symptoms developed for a time, but the patients recovered. In all the cases, excepting two, the fetus was killed. Of these two, in the case of Hicks, the method was abandoned after two trials; and in the case of Garrigues the fetus was displaced from the tube into the uterus, where it continued to grow. In more than half of the cases it is distinctly stated that the tumor either entirely disappeared or became shrivelled up into a small mass. In the cases of McBurney, Garrigues, and Trush, the current set up contractions in the muscular layer of the Fallopian tube, which resulted in the expulsion of the fetus into the uterine cavity."

This summary of the collected cases presents a very favorable showing for the method by electricity, and, in my opinion, merits more extended trials.

The treatment of myo-fibromata of the uterus by means of the electric current was inaugurated, in its present shape, by Dr. Apostoli, of Paris, only a few years ago, and has attained a very prominent place in gynecology through his genius, energy and enthusiasm. To him is due the application of the current in greater force and strength than was before thought safe to the patient. By the precaution of starting the current in a gradual manner, and cutting it off in the same way, and by measuring the dosage with an accurate milliampéremeter, he is enabled to use a strength of from 300 to 500 milliampéres without exciting unbearable pain. The manner of application is either by placing the negative pole in the uterus and attaching the positive to a layer of wet potter's clay placed on the lower half of the abdomen, by which the current is more diffused and rendered milder, or by electropuncture per vaginam into the tumor. The theory of the effect is that of electrolysis, as well as the compressing effect of the muscular tissue surrounding the neoplasm which is brought into action by the current. The practical result seems to be that some tumors are completely resolved, others are greatly diminished in size, and others again suppurate. Sometimes the tumor, before submucous or intramural, has

been forced into the uterine cavity and finally extruded *per vias naturales*, as in a case of Mrs. Dr. Jacobi, in the August number of the *American Journal of Obstetrics*. Some others, it is admitted, are not much influenced. Seances are of ten or fifteen minutes' duration and are repeated from thirty up to several hundred times.

To do justice to Apostoli's method, we must consider the nature and natural tendency of these myo-fibromata, and compare the rival methods of relief in use. The period of active growth of these tumors being commensurate with the menstrual life of the female, it is well known that the majority cease to enlarge after the menopause, sometimes decrease, and permit a lessening of pain and hemorrhage, so that for such it may be only an object to ameliorate the symptoms, in order to tide the patient over the dangerous period. Medication with ergot and ammonium chloride has accomplished a good deal for the relief of many cases, yet it is too uncertain to depend upon. The two surgical procedures now practiced are hysterectomy, by laparatomy; and removal of the uterine appendages, so as to create an artificial menopause. Now, although the various operations performed by abdominal section come under the head of major operations, yet, under the influence of modern cleanliness and asepsis in the hands of expert specialists, the dangers of these grave operations have been greatly reduced. According to the statistics of hysterectomy for myomata, collated by Mr. Greig Smith, in 539 cases operated on by European surgeons between 1878 and 1885 the mortality reached 30 per cent. But he says that the mortality in cases operated on in the last two or three years is not so great by far. "Keith's mortality, in most unpromising cases, is only 8 per cent; Tait's mortality, in his last 50 cases, is very low," etc.; and the same author, although belonging to the school of Lawson Tait, remarks: "A further and more important question is, whether, with a death rate even of one in ten, the operation is ever justifiable." To say the least, in a large number of cases a surgical operation is not imperatively demanded, and it is in such cases that

galvanism can be recommended. Even admitting that all the cases of myoma to which electricity is skilfully applied are not permanently cured, we yet find abundant proof of its value. And when we read the indications laid down for the operation of hysterectomy by so prudent and cautious a surgeon as Mr. Keith, we see that the range of cases for this procedure is very limited.

It is true that Mr. Tait and his followers condemn, in no measured terms, Apostoli's methods, and we find that a writer in the *New Arch. of Obstetrics and Gyn.*, No. 1. for 1888, gives, as the result of experience in the *clinique* of Doléris, the following statement: That, after a trial of the methods of Apostoli, no disappearance or marked diminution of the tumors was noted; that the apparent decrease was illusory; that the pains were not specially relieved; while in some cases hemorrhages were stopped, it was only temporary, and the conclusion is drawn that the method is only a palliative one, on which little dependence can be placed.

Per contra, the evidence in favor of the success in the treatment of uterine fibroid by the galvanic current is presented by the high standing of Dr. Apostoli himself, and the accepted published reports of his numerous successes. Out of several hundred cases operated on, only two deaths, and these, as stated by himself, need not have occurred under better management. He freely admits that in many cases the tumor has not been entirely resolved, but in most of these he claims that the pains, hemorrhage, and other distressing symptoms have been relieved. That where a radical cure could not be produced, a symptomatic cure was attained.

As corroborative testimony to the value of electro-therapeutics in this form of uterine disease, let me extract a few of the conclusions arrived at by Dr. F. H. Martin, of Chicago; one who has thoroughly studied this subject, has had ample opportunities for arriving at a correct judgment, and who has himself added some valuable improvements in the technique of the application of galvanism. At the last meeting of the American Medical Association he presented a paper "On the

Value of Galvanism in the Treatment of Fibroid Tumors of the Uterus," and among a dozen or more rules laid down are the following:

"1. A means of generating a continuous current of electricity of steady and uniform character, that can give an actual current strength, through a resistance of two hundred ohms, of five hundred milliampères, is necessary to obtain all the benefits of this treatment.

"2. Fibroid tumors of small size can be completely absorbed by the proper application of strong currents of galvanism.

"3. Hemorrhages from fibroid tumors can be promptly cured by the local coagulating effect of the positive pole applied to the interior of the uterus; and severe neuralgias, so often accompanying these troubles, can invariably be relieved by three or four applications of this treatment.

"12. There is no excuse for any percentage of mortality in the proper application of this treatment. While Dr. Apostoli has had two deaths in two hundred and seventy-five cases, he candidly admits that they were due to avoidable accidents, and should not be considered as legitimate consequences of the operation.

"13. In experienced hands, and by the adoption of the present means of concentration, the most delicate and sensitive patient can receive, without experiencing severe discomfort, all the benefits to be derived from this valuable treatment."

To the above clear and convincing testimony of so eminent an American specialist, let us add that of London's great ovariotomist, Sir Spencer Wells, one who can justly claim "a longer and more varied experience than most men in dealing with uterine diseases, especially those which are characterized by overgrowth." In an address printed in the *Medical Record*

of June 9, 1888, he says that he became so interested in the reports that reached him of what Apostoli was teaching and doing, that in the autumn of 1886 he determined to see and judge for himself. He visited Paris, and, he continues, "Dr. Apostoli explained to me his views and demonstrated his mode of procedure. He threw open the records of his daily practice, and gave me the opportunity of verifying his diagnosis, and witnessing his treatment of the cases actually under his care. Besides this, he mustered for my inspection about sixty of the patients who had passed through his hands. I heard many of their histories in their own words, and could contrast for myself their actual condition of good health and activity with the symptoms reported in the early notes of their attendance, etc., etc. I spent many laborious hours in what, I may say, was a rigidly sceptical examination of the evidence before me, seeking for weak points in the system and the resolution of theoretical objections." "The conviction was irresistible that, though the method might not have reached its point of perfection, the work, so far as it went, was good."

Such then, gentlemen, is in part the evidence, pro and con, upon the therapeutic value of electric currents in uterine disease, and, to put it in a more condensed shape, I submit the following:

I. That the higher knowledge of the laws and forms of electric force of modern times, as well as the superior methods of application in gynecological practice, puts the employment of electricity on a broader scientific basis than ever before, and gives promise of a still more extensive usefulness.

II. That in these days when we are compelled to be guided by the practice of experts and specialists in regard to given procedures, we cannot admit that either faradic or galvanic currents will supplant completely and in every case the surgical methods in use, guarded by modern asepsis and cleanliness.

III. That the practice of electro-therapeutics requires not only an extended special study beyond the usual curriculum

of the schools, but that the outfit being quite expensive, and the time consumed so great that several assistants are required in a moderately large practice, the result will be that only specialists in large cities will make a success.

IV. That as a remedial agent in diseases of women, it is not to be ridiculed, but is one of great value in certain cases and in expert hands, and is destined to accomplish for the relief of female suffering what neither medicine nor surgery can in certain cases.

Lastly. It is evident that the professional minds of to-day are not agreed on the value of electro-therapeutics. The majority of gynecologists even ignore this method, while in the hands of a comparatively few it is a favorite means of cure. Altogether, we think that it has in the last two years gained much favor and made many converts to its ranks.

FIBRO-CYSTIC TUMOR OF THE UTERUS.

Unusual Treatment.—Cure.

By E. J. Beall, M. D.,

Fort Worth, Texas.

At the April, 1887, meeting of the Texas State Medical Association, I presented a paper upon "Uterine Fibro-Myomata Complicating Delivery." In that paper I strongly urged enucleation, in lieu of other measures, and gave the history of a case in which I enucleated a fibroid weighing three pounds, that completely blocked the pelvis, having incarcerated behind it a male child weighing fully ten pounds. The case was successful in every particular; mother and child both well at the present time.

Twelve weeks ago I was called in consultation with one of the most intelligent physicians of this section, to see Mrs. S——, aged thirty-seven years; married one year; had never conceived.

Her mother, a sister, and a maternal aunt, died of "malignant disease" within the abdominal cavity. Upon her cousin I had performed laparotomy for intra-peritoneal abscess that followed childbirth. She had suffered from metrorrhagia for several years. Some time prior to marriage her abdomen had begun to enlarge, and at the time of my visit

the fundus uteri reached a point somewhat above the umbilicus. She was anæmic from profuse and protracted hemorrhage; had more or less abdominal pain.

A few days before I visited the case, an electrolytic trocar had been introduced into a fibro-cystic tumor that extended into, and very much distended the vagina. As a result, an ulcerative, gangrenous process had arisen, attended with slight flow and odor. To the above procedure, though strict antisepsis had been observed, I attributed the elevated temperature and increased frequency of pulse, which I found present at my visit. Yet, some days prior to the elevation of temperature there had existed fever, which readily responded to quinine, and the patient lived in a malarious locality. The abdomen presented a symmetrical contour; the enlarged and elevated uterus inclined only slightly toward the right side.

An examination disclosed a hard, slightly elastic tumor, filling a very much dilated and elongated vagina, extending to and slightly bulging the labia, and just within a firmly closed and rigid os. The finger could be swept around the mass; the edges of the cervix uteri could be made out, but the os was widely dilated, and occupied by the growth.

As the tumor gradually developed, the uterus was both dilated and elevated, and the vagina dilated and lengthened. A sound could be introduced into the uterus on one side to a considerable depth; but the sound movement was quite limited, and indicated a very lengthened and narrow cavity unoccupied by the attachments of the growth. This led me to infer that I had a tumor to deal with, the attachments of which, to the internal surface of the uterus, were quite extensive. Palpation and percussion also indicated a large, firm, very slightly elastic tumor, doubtless fibro-cystic, filling the vagina and elevating and enlarging the uterus to the dimensions already indicated.

These facts of the case well in mind, what course should be pursuedt hat would prove safest for a patient whose life is in the balance, to be turned for weal or woe by the act needed to be carried out by the physician for relief?

It may be well to review some of the measures hitherto suggested for the treatment of uterine fibroids, that the hearer may be prepared for comparison when I present the plan adopted, and which terminated so happily in this case.

Palliative treatment, while applicable to minor and less severe cases, promised little in the one under consideration. Correcting the displacement of the uterus was not indicated. Arresting hemorrhage by hemostatics, tampon, rest, etc., could only put off the inevitable day for action of a decisive character.

The medical treatment by alterative agents, whose office, it is thought, is to induce fatty degeneration; the use of ergot, which in some cases has produced good results, when tumors were decidedly interstitial—or perhaps subserous (more particularly the former), when muscular contractility (the result of ergotism) would induce compression by muscular fibre, this method was not, in my mind, applicable; at least would be fraught with danger, by reason of the delay needed, before radical results could be expected.

From reading and experience I could not expect that electrolysis, so strongly urged by Apostoli, could effect changes in the growth with sufficient rapidity and thoroughness, nor sufficiently exempt from danger, to commend it to the case, which I thoroughly believed required prompt, immediate measures.

To the art of surgery, and its ready application, I now turned for a remedy.

I. Was abdominal section advisable? I believe there are those who would have resorted to the measure. That road has many a warning post. To one of limited experience, at every crook and fork, it is like a boatman slowly and gently descending some placid, winding stream; suddenly and unexpectedly he encounters unforeseen rocks or falls, while just before, everything was merrily well. The abdomen opened; an enlarged uterus and fibro-cystic contents turned over the pubis; the broad ligaments ligated off; a large dilated and

filled cervix to be cobble-stitched around, secured, and tied, disengaging a mass from its circular grasp; that cervix as large as the calf of one's leg, is pretty to read about in books and journals; is exciting, and does well when one has the ægis of a metropolitan hospital, with its reports fingered only by the actor, and has leisure for study of results at a dead-house, the janitor his vigil; but upon the living woman, at a farm-house; the laity his audience; the husband, the mother, the sister, hard by the operating table, the surgeon is urged to seek a safer, less formidable plan of treatment, if his conscience will allow, and his judgment devise such.

II. As the tumor could be drawn downward, should I attempt to cut it away with scissors? This is sometimes practicable, and has been done often.

III. After traction with a vulsellum, should I endeavor to encircle the mass with the *écraseur*, and sever, as near as practicable, to its fibrous attachments?

IV. Should I endeavor to remove the tumor with Dr. Thomas' serrated spoon, as has been done rapidly, safely and surely, so often, by that brilliant man and his followers?

V. Should I enucleate, as I had done in former cases—a notable instance of which I have heretofore brought before the profession?

The high opinion I entertain of this last measure induced me to preface this paper with a reference to a case in which I put that plan into successful execution. It is, in many instances, easily done, and attended with little danger. I urge the method when practicable, which it is in very many interstitial, submucous, and mixed tumors. My first effort in this case was to institute the enucleation process. At several places I essayed the plan, but signally failed; the capsule could not be peeled from the growth.

To have incised the capsule (to which I have not referred, as I write *currente calamo*), and endeavored to force a gradual

extrusion of the intra-capsular fibro-cystic growth by ergot, would have involved much time, besides subjecting the patient to further systemic infection.

As to the first proposition: Disinclination, by reason of inexperience, and fear of shock, etc., prevented its adoption.

As to the second and third: I could not consent for various reasons. Pertinently, portions of the mass would have been left, presenting a surface through which poisons could readily reach the uterine sinuses, and lymphatics, and thus originate a process of systemic infection fraught with great danger.

As to the fourth: The objections urged against the second and third are of equal import here. Additionally, in the hands of one whose experience with the Thomas serrated spoon is limited, uterine tissue may be injured—even the peritoneal cavity might be invaded.

Having referred to the more prominent measures relied upon for the removal of growths connected with the uterus, it must not be inferred that cases do not occur to which these various plans are applicable. But to tumors with a broad and extensive intra-uterine attachment, the sawing process, the *ecrasement*, or the incision must be followed by a digging out of tumor remains—a harsh usage of the uterus, accompanied by the danger that belongs to shock, hemorrhage, etc. Even after much digging, tumor elements will be left which may develop again at a future time, entailing, perhaps, if nothing more, a hemorrhagic condition of a new endometrium, great risk of infection, etc.

I do not claim that the manner in which I treated the case, the *technique* of which I am about to relate, is without precedent. But the plan has no advocates; and if such cases are known to others of the profession, they may have used similar management accidentally, not intentionally. This, however, is not so in my own case. What I did was not an accident growing out of an effort to do otherwise, but was the outcome of premeditation.

If I am to be criticised for the method pursued, it must not be ascribed to rashness, but to sober thought and conscientious conclusions. At all events, the patient lives; the interested ones of a good family are happy; and I have the knowledge that they have applauded and appreciated the services rendered in the (to me) interesting case.

The patient was placed in the dorsal position; hips elevated, and chloroform administered. Sawyer's forceps were introduced as high as the cervix, and caused to embrace the tumor; gentle traction with slight to and fro movement was exercised. Very soon the labia and perineum were bulged outward by the tumor, upon which traction was made. The left hand was held upon the enlarged abdomen, and the uterus could be felt descending *pari passu* with the advance of the tumor within the grasp of the forceps. At this stage of the operation I intended doing an episiotomy, to avoid an irregular laceration of the perineum, which was becoming pronouncedly distended. I did not do so, however, but elevated the handle of the forceps and endeavored to keep pace with the perineal tension. By external palpation and intra-vaginal examination I watched the lowering of the uterus and the condition of the parts, as delivery progressed. Just here, notwithstanding the traction was cautiously and gently done, I discovered that the thinned perineum was giving way. I had now withdrawn at least a pound of the seven-pound growth beyond the external genitalia, and at once instituted search for cysts, upon finding which I opened and relieved them of viscid colloid material, thus reducing the mass I was endeavoring to remove. I then enlarged the perineum and made further traction, and further reduction by disposing of other small cysts. Pursuing this plan, I was soon enabled to introduce my hand (having removed the forceps) by the side of the tumor, grasp it, and make more intelligent traction. A few minutes later I could insinuate my hand into the uterus, grasp the tumor more firmly, and determine that the attachments were very general. Instead of removing large portions of the tumor and allowing fragments to remain, I determined

to gently *invert the uterus* (which I did) and bring into view the attachments of the growth, in order to more thoroughly separate it from the uterine wall, and better stop the bleeding with hemostatic forceps, and hot sublimated water. The tumor now being entirely removed by aseptic fingers and scissors (a hypodermic of ergot having been given) the bleeding all stopped. I *returned the uterus* to its normal position with great ease. The perineum was neatly stitched with No. 3 gut ligature, and the patient was put to bed with her knees tied together.

Doing what I did, I could observe strict anti-sepsis. I left nothing within the uterus, nor returned anything for septic mischief. Little or no shock supervened, and but little hemorrhage. The patient was soon comfortable. No fever or other untoward circumstance retarded a rapid restoration to health.

The perineum was primarily united; menstruation is occuring normally; health is reëstablished, and a happy husband has a happy housewife, every way qualified for her duties—domestic and marital.

LACERATION OF PERINEUM AND RECTOCELE.

By J. H. Blanks, M. D.,

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When Emmet recognized and called attention to laceration of the cervix, and gave it an important place in the etiology of various direct and reflex intractable suffering of women, he placed the medical world under lasting obligations to himself. Had he done nothing more, before or since, this was enough to immortalize his name.

Page after page is devoted to laceration of the cervix, by numerous authors, and almost every conceivable reflex phenomenon is laid at its door. No one to-day questions the importance of the lesion. The writer can recall many cases in his own practice where trachelorrhaphy was followed by relief, when life was a burden.

But, from some cause, authors have not given sufficient attention to laceration of the perineum, and its almost invariable effect, rectocele. Why is it so little is said about the perineum? We seldom hear of a perinorrhaphy for the relief of remote or reflex troubles.

Cases like the following are frequently reported: "Trachelorrhaphy was done, and the retroverted uterus was placed in position; perinorrhaphy was also done to give support to the pessary, and the patient cured."

The perineum is often enough restored, but with no idea of benefit, except in a mechanical way.

If it can be shown that lacerations of the perineum and rectocele give rise to suffering of equal, if not greater intensity, than lacerations of the cervix, the object of this paper will have been accomplished.

The frequent disappointment following trachelorrhaphy when the perineum was overlooked, and the almost universal satisfaction where both injuries were treated, called for the inquiry, whether the perineum and rectocele were not the most important factors.

To test the question practically, several cases were treated, of which the following are fair illustrations:

Mrs. S——, aged thirty-six, the mother of seven children; perineum torn at birth of first child; had fair health till five or six years ago. Indigestion and palpitation for some time, were the only symptoms. Constipation and diarrhea followed. When constipated, mechanical means were often necessary to unload the rectum; nervous symptoms, distressing insomnia, and a "desire to utter loud screams." During the past year she suffered constantly from irregular, uncontrollable fever, ranging from 100° to 102°. Gradual emaciation and extreme exhaustion resulted. At this time she was examined by her physician, who found the cervix lacerated and the uterus retroverted; perineum lacerated to the sphincter ani and a large rectocele.

Aided by Drs. Izard, Miller, Clarke and Buchanan (who frequently assisted me), and other physicians of Meridian, Miss., to whom I am equally indebted for kindly services, I did Simon's improved colporrhaphy, using six silk sutures, and closing the perineum with silver wires. The uterus was left untouched—lacerated and retroverted. Daily 1–4000 bichloride hot vaginal douches were used, and the bowels kept soluble by a gobletful of Champion water, before breakfast. The silk sutures were left to cut out, and the wires removed on the eighth day. Good union. From the day the

sutures were removed she began to improve. Nervous symptoms departed. Instead of tossing in bed, so nervous she could not rest, as formerly, she could now sleep undisturbed from 8 p. m. to 7 a. m. From that day to the present time, now more than fifteen months, she has had no rise of temperature; bowels act naturally once a day, and she steadily increased in weight until she went from 120 to 161 pounds—her normal weight. Indeed, she is the picture of health, happy and well pleased with her condition; and yet her uterus is retroverted and cervix lacerated.

Mrs. G——, another case, with vitality so completely lowered that the use of an anesthetic caused great anxiety. Fever, of many days' duration, at irregular intervals, was a prominent symptom in her case also. It is true that trachelorraphy was done in this case, but I feel quite sure that the successful operation which was done at the same sitting for the relief of the large rectocele and lacerated perineum, would have relieved her, had the cervix operation been omitted. She immediately began to improve; had no more fever, and soon reported herself entirely well.

Mrs. B——, complained of all the usual distressing nervous symptoms, and had been failing in health for several years. She had no temperature rise, however. This was before I began to think much about the perineum. I found, upon examination, bi-lateral laceration of the cervix, and marked cervical endometritis, with a granular, eroded os; perineum lacerated and small rectocele.

The cervix, after the usual preparatory treatment, was closed. She was somewhat benefited, but after several months, experiencing no decided relief, she was subjected to colpoperineorrhaphy, when improvement was marvelous, and she declared herself well.

The frequent repetition of such cases, and the temperature in so many of them, which invariably subsided after an operation, together with the fact that I could find no published account of such, led me to call your attention to the subject.

About the time I was investigating the subject another case, of deep personal interest to me, required my attention. This lady had sustained a slight laceration of the cervix and deep perineal laceration, extending to the sphincter ani. This occurred at the birth of her first child, eight years before, and was followed by a slight rectocele. She had the usual symptoms of such injuries, viz: Nervous excitement, palpitation, indigestion, slight intestinal catarrh, alternating diarrhea and constipation. In addition to this, for fifteen months she suffered with pain in right lumbar and pelvic regions, accompanied by pronounced rigors and high temperature (104° to 106°), which recurred at regular intervals. During the intervals her temperature rarely fell below 101°. She was seldom free from pain in the region of the right ovary, which was found to be slightly enlarged and prolapsed. Menstruation all the while normal. She was seen by many eminent physicians in the South, no one of whom succeeded in making a correct diagnosis.

At last she was seen by Dr. H. Marion Sims, of New York. At this time she had escaped the rigors and high temperature for a period of six weeks, but had an average temperature of about 100°. She was greatly emaciated, and growing weaker daily. In the absence of anything else to account for her symptoms, Dr. Sims closed the cervix with catgut, and did colpo-perineorrhaphy. Improvement was almost immediate. Temperature became normal, pain subsided, and she had an uninterrupted recovery. At this time, now twelve months since the operation, she is enjoying perfect health.

Could these lesions give rise to such symptoms? I can only answer the question by pointing to the result.

Another difficulty in the way of progress in the study of this subject, is diagnosis. I have been surprised at the number of otherwise good practitioners who could not always diagnose a laceration of the perineum; and a still greater number who knew absolutely nothing about rectocele. Yet

there are few physicians who doubt their ability to diagnose either. This error is frequent where the perineal rent involves but slightly the skin.

Another idea prevails largely among physicians, as well as the laity, that the "obstruction" which is complained of in rectocele is the uterus retroverted and pressing against the rectum. If the uterus is of normal size it cannot obstruct the action of the bowels.

As to the method of operating, I will say that, after a trial of nearly all the methods, I prefer Simon's improved colpo-perineorrhaphy, using silk for the rectocele, which is left to cut out; and silver wire for the perineum, taking care to extend deeply on each side and include the pelvic fascia.

As a result of close study, and a not very limited experience, I have arrived at the following conclusions:

I. That lacerations of the perineum and rectocele do not receive the attention their importance demands.

II. That many operations on the cervix for the relief of reflex phenomena are successful because perineorrhaphy was done at the same time.

III. That lacerations of the perineum, with rectocele, will produce decided febrile movement, of long duration, strongly simulating malarial toxemia.

IV. That rectocele is the cause of many cases of chronic diarrhea and dysentery of women.

V. That it is *a* cause of the indigestion and nervous phenomena known as hysteria.

VI. That many cases of laceration of the perineum are not recognized, because the tear does not involve the skin.

VII. That relief often follows the use of pessaries in versions, not from the pessary, but because the perineum was closed to support it.

THE FIELD AND LIMITATION OF LAPAROTOMY.

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It may appear superfluous to my hearers to discuss a subject which has been so ably and so frequently ventilated for some years past.

My chief object is to map out, or define, the limit of the operation known as laparotomy, and to show when, and by whom it should be performed. I shall not allude to the pending differences as to the etymology of the word, or discuss its appropriateness, but shall endeavor to show how often its indications are unheeded until too late to be of service in saving human life. There exists great distrust in the mind of the laity as to the propriety of such an operation, and not without cause, as very many in our profession are exceedingly slow to advocate its necessity when the proper time has arrived for its performance.

The field for operative work inside the abdomen has so much widened as to include every organ and tissue, and this even in the last decade, making, as it does, the most important advance in surgery. Even the liver, spleen and pancreas

have been invaded, and they are no longer set apart as without the pale of safe interference. We owe our thanks greatly to Tait, Wells and Senn for these surgical triumphs, as they have shown beyond controversy the possibility of reaching and dealing with the abnormalities of these organs.

It may now be justly claimed as safer to incise an hepatic abscess through an abdominal wound than to aspirate, and possibly infect the abdominal cavity. All those who have witnessed or performed a cholecystostomy or cholelithotomy can understand how such splendid results follow so wise a procedure.

Some operators have boldly incised portions of the liver, but we will not include this in the present brief paper, though it is but necessary to allude to closure of incised, or other wounds of the liver, to be reached through an abdominal incision. I will not consume your time by alluding to the special surgery of the spleen or pancreas, though the former has been removed, incised, and otherwise treated by the surgeon, while the latter organ has, notably by Senn, been reached and treated for cystic degeneration.

The stomach has been repeatedly operated upon for stricture of either extremity, and repair of various injuries, such as wounds, etc.; also for the removal of foreign bodies and gastrostomy for stricture of œsophagus.

The surgery of the intestines is now an open field, where there are brilliant cases on record, showing its possibilities, and we may infer from the past what may result from continued observation and experience in this direction. But few years have passed since Hamilton, or Washington, Bull, of New York, and Parkes, of Chicago, reported cases which almost revolutionized intestinal surgery. We know in this as in other history how earlier pioneers perhaps had some success, but not lasting reputation. They did not have the Czerny or Lembert suture, or did not have such perfect surgical *technique* as we have to-day. In fact, we no longer hesitate to open the abdomen when we see clearly that

a bullet, or a knife, has entered the peritoneal cavity; the opium, or let-alone policy, has vanished from progressive minds.

Thus we have re-sections and ex-sections for wounds, ruptures, lacerations, tumors, or carcinomatous infiltration, the latter alone of doubtful expediency.

It is possible in perforating typhoid ulcer that a laparotomy may save the patient. It would be interesting to know what effect the excision of a typhoid ulcer, or ulcers, would have upon the course of the fever if such an operation could be tried.

Enterostomy for removal of obstructions may safely be resorted to. Laparotomy for peritonitis from perforative appendicitis will surely become a fixed necessity.

The kidneys, ureters and bladder are reached by laparotomy by many surgeons, though often without touching the peritoneum, as in the high operation for stone.

But we have accumulating evidence in favor of nephrectomy rather than nephrotomy in cases where the hydro or pyonephrosis has caused grave structural changes in the kidneys. Mr. J. Knowsley Thornton decidedly prefers a laparotomy in removal of the kidney.

Laparotomy is justifiable in various pathological conditions of the pelvic organs, and it needs no comment of mine to influence the pending sentiment favoring such operation. If ovaries are so frequently removed for chronic disease, it cannot be questioned that in cases of abscess in and around the Fallopian tubes, and in ectopic gestation, there should be no longer any doubt as to the propriety of such a procedure.

Cysts of the peritoneum are often removed, and various diseases, such as tubercular and suppurative inflammation treated by laparotomy and the necessary cleansing and draining.

Having named in a cursory manner some of the possibilities of abdominal surgery, I ask your forbearance while I dispose of another part of the subject. The classification of these operations into any rational order for discussion is

indeed difficult, nevertheless I have to suggest the following in view of the fact that I desire to show to whom we should look for successful operative work.

If I formed two columns and placed all chronic cases, such as cystomas, fibromas, etc., etc., in one, and all the acute cases or those of emergency, such as acute intestinal obstruction, or wounds and rupture of tubal gestation in the other, I should then give my idea of the operator to be chosen for the work in hand.

The former can be and should be treated in special hospitals by skilled operators, while the latter must, in view of so large a percentage of our population being rural, be operated upon as often by the general practitioner, who, *nolens volens* has the case in charge, as by the abdominal surgeon.

Just here occurs the strong desire to discourse upon the utter inability of so many practitioners to make a proper diagnosis or prognosis; but for the present I forbear.

Medical literature is replete with reports of cases where, at the autopsy, some remediable condition was found and could only have been known and reached by a laparotomy, and yet not the half of these unfortunate cases have been published. We will occasionally see a report where, after an obstruction of the bowels, lasting for many days, a portion of the bowel comes away, having sloughed, following intussuception, the patient's life in the meantime in jeopardy. The attendant takes a considerable degree of pride in the successful conduct of the case, while it must, notwithstanding all this, be considered bad surgery; for nature, or act of Providence, or accident saved the patient's life, and not the doctor.

In the *American Journal of Medical Sciences* for July, 1865, a case is recorded showing the cause of death in a patient suffering from obstruction of the bowels to be a small knuckle of the colon twisted upon itself. At the *post mortem* turning back of this at once removed the cause of the obstruction. The writer very properly suggests laparotomy in a similar case. As it involved no surgical repair of tissue or any dexterity beyond that possessed by the average surgeon, it certainly could have been accomplished.

Public sentiment at that day, even in the medical profession, did not justify laparotomy in similar cases, though we know the successful operator in any case would have been loudly applauded. These cases of obstruction are so often encountered as to make frequent allusion to laparotomy a necessity, and yet how often patients are really hastened out of the world by attempted purgation and other measures intended for their relief.

This paper is not intended to be a compilation from medical works on this subject showing statistical and other matter already on record, but is rather intended to quicken the growing sentiment in favor of early resort to laparotomy when indicated.

In thus dealing with the subject I can best illustrate the thought by the following cases:

In 1874 I was called to see Miss ——, October 18, who had been suffering from supposed colic for two days, and who had taken morphia, yet without much relief. There was constipation and tympanitic distension of the abdomen, pulse 110, temperature 101, with tenderness over region of ileo-cæcal valve. Purgatives were vomited, enemata came away not colored. In short, after two days, the patient was dead.

The autopsy revealed a gangrenous vermiform appendix with small gravel (probably cholesterine) therein, with general peritonitis following this. In this case the peritonitis was unsuspected, at least as to its severity.

It was in the days when with the advent of the clinical thermometer too much reliance was placed upon its readings. A laparotomy and excision of the appendix would probably have saved this poor girl.

In 1876 I was called in consultation to see Miss ——, who had been successfully operated upon by Dr. ——, a famous gynecologist, for dysmenorrhœa, by öopherectomy, three months since. I reached the patient's side just to see her die of internal hemorrhage after several days' illness. There

was unquestionably hemorrhage from the old pedicle. A laparotomy done when the collapse commenced would have revealed the dangerous bleeding point and it could have been secured.

In August last I was called in consultation to see a lad, aged twelve, who had been kicked in the epigastric region by a horse. He gave all the signs of grave internal injury at the time of the accident, but appeared to rally under alcoholic stimulants. At the attending physician's next morning visit collapse had commenced, but the consultation was set for late in the afternoon—6 o'clock. The boy was then nearly dead, and I had not even been told to bring instruments and be ready to operate. The autopsy revealed a rupture of the jejunum the size of a dime, with general exudative peritonitis from fecal extravasation. Half a dozen sutures would have closed this door of death.

Immediately after my arrival at home in June last, from a long vacation, I was called to see a former patient of mine who had been dangerously ill for five weeks, at first with puerperal fever and then passing into a "nameless condition," in which powerful stimulants, anodynes and antipyretics were given without avail. Digital examination discovered a small (probably tubal) abscess in the left side, which doubtless was the cause of the alarming illness.

Fortunately for the patient, she was enabled to run the gauntlet of the many dangers incident to such prolonged high temperature and the presence of an abscess in danger of rupture into the peritoneal cavity. The medical attendant had battled bravely for this woman's life and had saved her to her family if not to perfect health. I doubt very much if she will ever attain her former health while this abscess remains, even if it is in the Fallopian tube, and must remain a source of danger and suffering. I could not obtain consent for its removal.

This is a case narrated, not for the purpose of showing a victory for the so-called conservative over-surgical treatment. It is called up to help form a basis for future action, and the question arises, did the patient receive the proper treatment? Is it wise to permit a patient to remain in such grave danger when it is known that by abdominal incision the abscess can be reached and removed, washed and drained. I must say that in this case there was no pointing or apparent possibility of reaching the pus safely through the vagina. I entirely and emphatically refuse assent to the declaration that her chance of recovery proves anything favorable to the "let alone" policy.

These pelvic abscesses frequently are too high for drainage through the vagina, and it has been left for laparotomists to discover that they frequently, perhaps generally, form in the tube, and, after rupture, have their investment made of peritoneum including that covering the intestines held together by adhesions.

It is difficult to prove that any abscess opened per vaginum is without the peritoneum, for they may be, as above stated, limited to the pelvic cavity by adhesive inflammation.

Most of the cases alluded to were of that period of surgical history when it was rarely possible to obtain consent for an abdominal section in the country, and, indeed, it was seldom resorted to by the leading surgeons, except for large tumors.

These cases are mentioned merely because they typically represent different conditions and could be greatly multiplied, as they illustrate the matter in hand, and should serve to strengthen our conscience in the direction of early and vigorous methods to prevent almost certain death if left undone many hours.

We have abundant evidence that in septic peritonitis, or even in the tubercular variety great success has followed simple incision and washing out the peritoneal cavity.

We know beyond doubt that warm water (temp. 100–110) poured into the abdominal cavity of a patient, feeble from

shock, often serves to revive and sustain her even under very dispiriting circumstances. This alone should embolden the surgeon to disregard shock in so far as to wait for its disappearance. My experience has uniformly been that grave peritonitis accompanies shock in abdominal injuries. Again, in observing the experience of other operators and writers, we see how rarely, if ever, the abdomen is opened unnecessarily in acute or sudden disease, or accident, while there are often indications that too many operations are done for removal of ovaries and tubes, etc.

The limit, then, in operative work of the second class, or in acute disease, is nearly the same for the general practitioner as the skilled special surgeon.

The exigencies of the hour demand more and better surgeons in the smaller towns and villages, for there is no time to send many miles for a special surgeon. Morevor the statistics of surgery in America will immensely improve when the profession, as a whole, learns when to operate in such cases as acute intestinal obstruction, estopic gestation and delayed labor.

There should be more good operators, and more still who early diagnose the necessity for an operation.

It appears just here best to speak of the prognosis of diseases or injuries of certain organs above or below the umbilicus. To a fair operator it is much easier to reach the intestines or peritoneum, omentum and pelvic organs, if the incision made below the umbilicus will answer.

It becomes at once more difficult to reach the liver, spleen, stomach, etc., above the line alluded to, and in most cases a skilled operator only can succeed in any such procedure. In cases of perforation by a bullet, or in stab wounds, or in rupture, it goes without saying that only the bold, brave surgeon succeeds who promptly faces the urgency of the case and acts thereon. How often delays have killed, the great unknown will never tell! We will suppose a case: Dr. A. is called to see a child who has fallen heavily upon the abdomen. He is in shock, has vomited (possibly blood in the vomit). The

abdomen is distended and sensitive to touch, the pulse is feeble, and, in short, certain death stares the little fellow in the face unless prompt work is done. There are two courses to pursue: one is to tell the parents that it is necessarily a fatal case, that a blow often produces syncope by concussion of the solar plexus, and that the chances are as good without as with operation, "at any rate I will stimulate the child, and if he does not rally I will send for Dr. B. and we will discuss an operation." The parent, often unwittingly, accepts the above advice.

Another way would be somewhat as follows: "Your child is evidently suffering from grave internal injury, the symptoms are those of internal hemorrhage, or rupture of the viscera. An operation is the only resource known to medicine or surgery by which it is possible to save the ehild. If, upon opening the abdomen, the injury is easily found and remedied, the child will have a fair chance for life. Should the complication prove too severe for repair, it can only be known upon inspection, and an exploration will not shorten life." Should the great error be made, of doing an unnecessary operation, no harm would result necessarily, save to the reputation of the surgeon. In most cases upon proper consultation early after accident of this kind, consent can be obtained to perform an operation. But a halting or doubting expression of opinion effectually debars all chances for operating until too late.

Mr. Tait has demonstrated beyond the shadow of a doubt the feasibility of operating successfully in ectopic gestation. Dr. Bantock has recently operated successfully for the same condition (private letter) while in America, the list of successful operators is constantly growing.

The already exceeding length of this paper compels me to summarize as follows:

1. All abdominal organs may be reached and successfully operated upon if the operator is skilled in abdominal surgery.

2. Every surgeon should be prepared to open the abdomen, if the symptoms indicate acute disease or injury, as the cause may be easily found and remedied.

3. If the case is one of malignant disease, and is attended by great depression, it is better to close the abdominal wound without further interference.

4. Early opening of the abdomen in acute disease, or following accident, is imperative. Delay is often deadly. Critics have never claimed that too many operations are done for such complications, although we often see criticisms as to the propriety of ovarian and tubal operations.

5. Laparotomy, followed by washing and draining the abdomen, is the recognized and only successful treatment of suppurative or tubercular peritonitis.

6. In diseased uterine appendages their removal is justifiable when the patient's general condition demands it. In severe neuralgias, dysmenorrhœa and grave hysteria at the month, the only remedy is to remove existing disease. This rule applies to pelvic abscess when caused by a suppurating tube or otherwise.

APHORISMS IN ANTISEPTIC SURGERY AND GYNECOLOGY.

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In presenting this subject in the form of aphorisms, I hope to fill a need which we all feel—that of having before us short, trite rules, for practical use, devoid of the ambiguity of verbiage too often found in our medical literature.

Many of our young surgeons are literally frightened from a consideration, even, of antiseptic surgery, linking it with costly atomizers and expensive apparatus, while if the subject could only be brought before them in a proper light, showing its great simplicity, and at the same time its great worth, how easily it is practiced and how valuable its services and results, we would have them all believers in, and practicers of this, the greatest progress surgery has ever made, giving them better success in their surgical work.

Before taking up the practical part of the subject, it would be well to look at the pathology of suppuration, and deduce some reasons for the employment of antiseptics.

It is well known that the air is full of micro-organisms, Miquel having found that the ordinary city atmosphere contains over 2,000 per cubic yard, and likewise our water. Some of these are pyogenic, and, therefore, when we make

a wound we throw open the doors for the entrance of these germs.

Until recently, suppuration was thought to be caused by the direct action of certain micro-organisms upon the tissues, and that these so-called pyogenic bacteria do have a certain effect upon suppuration and the formation of pus, is undoubtedly true. Among the micro-organisms given credit for this pyogenic power, are the staphylococcus aureus, albus prodigiosus, bacterium termo, and the streptococci.

But since Brieger's discovery of the ptomaines, attention has been turned toward them as producers of certain morbid processes. Among these he discovered an alkaloid cadaverine, obtainable from putrefaction, with a chemical formula of $C_5H_{16}N_2$.

According to Grawitz, this alkaloid is non-poisonous, occurs as a colorless liquid, soluble in water, and a one per cent. solution has a strong alkaline reaction. He found that the pure alkaloid contained no bacteria, and that a 2.5 per cent. solution kills the staphylococcus in an hour, while a very small amount retards the growth of the bacteria. Therefore, the producers of cadaverine must be antagonistic to the staphylococcus. Cadaverine, when injected under the skin, will cause suppuration in from three to five days, depending upon the strength and amount used. When he injected a mixture of the bacteria and cadaverine, diluted enough so as not to affect the bacteria, he caused phlegmon in the surrounding tissues, followed by necrosis of the skin.

Suppuration is caused by alkaloidal ptomaines; but the presence of the pyogenic bacteria greatly augment and favor this action, and increase the suppuration by their metabolic activity, forming other alkaloids or ptomaines. Thus the saying, "Without bacteria, no suppuration," practically holds good.

These ptomaines act on the tissues primarily as an irritant, causing an exaggeration of nutrition, exudation of white and red blood corpuscles and serum, and afterward pus formation

and tissue necrosis. I hold that pus corpuscles are merely altered leucocytes.

Our object in aseptic surgery and gynecology is to prevent the alkaloidal formations from micro-organisms, which would otherwise render a wound or surface infected or septic, by keeping the wound free from these micro-organisms, and as this is nearly impossible, to either kill, or stunt and retard their growth.

This is, in other words, merely an observance of nature's law of cleanliness.

The great value of antiseptics and aseptic surgery and gynecology, can be seen at once by comparing the statistics, before and after its introduction, allowing, of course, for a certain increase in operative skill and dexterity.

APHORISMS.

1. Good surgery is aseptic, and therefore antiseptic surgery.

2. If perfect cleanliness were possible we would have no use for antiseptics ; and antiseptics without cleanliness are of no use ; the two must go hand in hand.

3. Asepsis at the first implies attention to details, and if the surgeon and gynecologist does not watch the minute points, he can never become successful in its practice.

4. A mere tyro, but with a good foundation in asepsis and cleanliness, will show better results than a more skillful operator who pays no attention to detail.

5. Antiseptic dressings are not applications to the wound itself, but to the discharge and to the skin surrunding it, rendering them an unsuitable soil for bacterial growth.

6. In changing dressings, which should be as seldom as possible, the wound should be covered while the surrounding skin is cleaned, and then the wound should be irrigated.

7. If suppuration does occur in a wound, it is due either to the operator's sins of omission or commission.

8. If we leave a wound in an aseptic condition, and apply proper dressings to prevent the contact and growth of bacteria, we cannot have suppuration.

9. Bacteria require a certain amount of water to develop, and if we can keep our wound surface dry we keep it aseptic.

10. The country practitioner can always practice aseptic and antiseptic surgery and gynecology as easily as his city brother who is near his base of supplies.

11. The surgeon and gynecologist should always carry, either a solution of the bichloride of mercury or the antiseptic tablets, (which are perfectly reliable, and are made by several good drug houses,) carbolic acid, iodoform, gauze, cotton, bandages, a nail-brush and soap. Surely, these will not burden anyone.

12. A convenient way of carrying the bichloride is to make a solution of one drachm of it in an ounce of alcohol; of this, one drachm in a pint of water makes a 1–1000 solution. Or you may carry 7½ grains of the bichloride and 2½ grains of sodium chloride in gelatine capsules, dissolving one in a pint of water, also giving a 1–1000 solution.

13. A more condensed way to carry it is to make a solution of 1 1-16 grains of the bichloride in 2 minims of glycerine, with the addition of ¼ grain sodium chloride. This represents 1 grain of the bichloride to two minims of solution, a small part being thrown down as calomel; of this, 15 drops to the pint make a 1-1000 solution.

14. The bichloride in an acid solution is more efficient as an antiseptic than in a neutral or alkaline one, and therefore it is well to add 5 parts hydrochloric or tartaric acid to each 1000 parts of solution. This also prevents, to some extent, the decomposition of the sublimate and prevents formation o the albuminate of mercury, an inert chemical, when brought in contact with the albumen of blood or serum.

15. Carbolic acid should be in pure crystals, of which 6 drachms to the pint of water make a 5 per cent. solution. A little more elegant preparation, and one which has no effect upon polished steel, and at the same time is devoid of the odor and caustic properties of pure carbolic acid, is a mixture of 1 part carbolic acid crystals and 3 parts powdered camphor. A 20 per cent. solution of this has the same germicidal properties as a 5 per cent. pure carbolic acid.

16. Iodoform can be carried in a tin pepper-box fitted with a lid to prevent spilling, or you can have one made to order. Tiemann & Co. make a rubber iodoform box, which is handy and convenient.

17. A solution of equal parts of pot. iodide and the biniodide of mercury, 1 to 4000 strength, is a most valuable antiseptic, being efficient, and can be applied to the skin in a 5 per cent. solution without causing any irritation.

Instruments, Dressings, Sponges, etc.

18. Instruments should be of the best steel, welded in one piece, or else the handle should be baked on, and instruments of more than one piece, such as forceps, etc., should be provided with patent locks, so we may take them apart and wash and cleanse every crack and crevice. They should be highly polished, preferably nickel-plated, except the cutting edge.

19. The handles should be smooth, with no rough places or notches for the lodgment of dirt and septic material.

20. Dressings may be bought in the shape of iodoform and bichloride gauze, etc.; but they are not satisfactory unless bought and used fresh, and then, they may be made cheaper at home.

21. To prepare the bichloride gauze, take 1 part of sublimate, 2 parts common salt, and 500 of water. The gauze is made of cheese-cloth, boiled in water with a little soda, until the grease is taken out. Soak this gauze in the above solution for an hour, wring out and partially dry. Put this in a

glass jar, air-tight, and keep slightly moist, and it will stay in a good condition for several months.

22. Iodoform gauze may be made by mixing one drachm of powdered iodoform with six ounces of castile soap-suds, making an emulsion. Rub this into 2½ yards of gauze, making a 10 per cent. gauze, which is sufficient, while for a 25 per cent., use 7 drachms of iodoform.

23. The best mode of rendering instruments and dressings sterile, is heat. Have a copper cylinder made, and fill it about one-eighth full of water. Into this place baskets or pans, containing the instruments, etc., and provided with legs to raise them above the water. The lid of the cylinder has a manometer, safety-valve and stop-cock. By means of an alcohol lamp the water is brought to the boiling point, the air being allowed to escape through the stop-cock. This is now closed and the temperature brought to 230 degrees, F.

This has the advantage of being perfect in its action and not altering the instruments, but is hardly practicable outside of hospitals.

24. If the instruments, however, are placed in a pan of water and the water brought to the boiling point, and there kept for ten minutes, bacteria are killed, and the growth of even the spores is much retarded. To insure boiling of all the water the pan should be covered. This is probably the best and most practical method of rendering instruments aseptic. They should be boiled both before and after an operation.

25. When this is not convenient, a carbolic acid solution of 5 per cent. strength should be used for the instruments, it being not so corrosive as the bichloride, and does not dull the knives very much. The camphorated carbolic acid is also efficient.

26. Tannin wool is an excellent styptic and antiseptic. To make it, add to distilled water pure tannin until saturated, stirring all the time. Then add cotton wool until all the solution is taken up. Put into an evaporating jar and dry, and

then keep it in a closed can. Before using it should be teased out. It may be iodized by adding an ethereal solution of iodine 1 grain to 2 drachms, allowing the ether to evaporate.

27. Sponges should be cleansed by either washing them thoroughly with green soap and an 1–1000 bichloride solution, or by the following method:

28. Take new sponges which are freed from sand by beating, and soak them in a 1–1000 solution of potassium permanganate for twenty-four hours. Then, after washing out the permanganate with warm water, immerse them in the following solution until they whiten, but no longer: Take of the sulphite of sodium one part, one-fifth part of a watery solution of either hydrochloric or oxalic acid, of a strength 8 parts to 100, and of pure water 100 parts. Taking them out of this, they should be thoroughly washed in clean, running water, and then kept in a carbolic acid 1–20, or a bichloride 1–1000 solution, in a close jar, until used.

29. Cleaning sponges with a 1–5 solution of sulphurous acid in water, after an operation, renders them perfectly white, so you may detect any clots or detritus which may have become enmeshed.

30. Sponges thus prepared are perfectly aseptic, and are cheap. A sponge which will sometimes come handy is made by taking balls of absorbent cotton of convenient size, and tying around them mosquito netting. These, soaked in a 1–20 carbolic acid, or 1–1000 bichloride solution, are practically aseptic. Half a dozen may be kept on hand, and, being so cheap, should only be used once.

31. Sutures and ligatures may either be silk, gut, silver or tendon, and should have been rendered aseptic in a 1–20 carbolic acid, or 1–1000 bichloride solution, or in case of gut, in the oil of juniper; or else they should be soaked or dipped into boiling water for a minute just before using.

Hands.

32. The hands should be thoroughly washed with a nail-brush and soap, preferably one of the antiseptic soaps, of which the biniodide of mercury is the best. Particular attention should be paid to the nails, cleansing the subunguial space thoroughly.

33. A 5 per cent. solution of carbolic acid is rather too irritating to use on the hands, and so the following method is recommended: After using the brush and soap, immerse the hands in 80 per cent. alcohol, which removes the oily layer always on the epidermis. By then rinsing them in a 1–1000 bichloride, or 1–35 carbolic acid solution, perfect asepsis may be obtained. Instead of the alcohol, ether, chloroform, or turpentine, may be used.

34. Drains may be of rubber, glass, horse-hair, or gut. Bone drains are not safe, as there is some danger of their infecting the wound. If we are certain as to their aseptic condition, they may be used, as they are rapidly absorbed, and so require no removal.

35. For draining cavities, particularly the abdominal, long glass drains should be used, reaching to the bottom of the cavity. By twisting a piece of bichloride or iodoform gauze into a rope and passing it to the bottom of the tube, the other end being lost in the dressing externally, we siphon, as it were, all liquids left behind inadvertently, and exudates. These ropes may be changed when necessary without disturbing the tube.

36. The effusion may be removed, also, by drawing it up with a small syringe, fitted with a piece of rubber tubing. This tubing is passed through the drain to the bottom of the cavity.

37. In an emergency case, common lamp wicking, impregnated with iodoform, may be used as a drain, particularly where the secretions are small.

38. Drainage tubes should never be used unless there are particular indications for them, such as rupture of cysts, unpreventable contaminations of pus, where we want granulation, etc.

39. In many cases, drainage by means of strands of catgut is to be preferred, it being absorbed often before the removal of the first dressing, not interfering in any way with asepsis.

40. Drainage tubes should be removed within sixteen to thirty-six hours, unless contra-indicated, as their presence prevents primary union, and there is some danger of infection from them.

41. All aseptic effusions are absorbed spontaneously, and are often of use to the system; and aseptic clots usually become organized and transformed into a solid cicatrix.

42. Wound cavities and cases where we want granulations may be packed with iodoform or bichloride gauze, it being removed when saturated.

Operation

43. The site of operation should first be shaved if it has hair upon it, then cleansed with soap, water and a nail-brush, then wiped off with alcohol, ether, chloroform or turpentine, and then with a 1–1000 bichloride solution. Cloths wrung out of the same solution should be laid upon the body covering the proposed line of incision, until the operation is begun.

44. Special care must be taken, when the field of operation is in the axilla or nates, as there the pyogenic bacteria most abound.

45. In operations on the head or face, the hair should be entirely covered with a towel wrung out of a 1–1000 bichloride solution. This should be tied on tight, to prevent infection in case the operator should wish to move the head.

46. During the operation the wound should be frequently douched with a 1–2000 or 1–3000 bichloride or a 1–50 carbolic acid solution, and the operator should now and then,

particularly before inserting a finger or hand into the wound, dip his hands into the same solution.

47. The spray is not often used, except before operations, to disinfect the air, as the current of air it causes may carry germs into the wound which otherwise would not enter.

48. The assistants should all have undergone a rigid preparation similar to the operator's, and should refrain from touching anything during the operation which would be likely to infect their hands.

49. Neither should the operator or assistants shake hands with new-comers, or feel the patient's pulse, unless one wrist has been disinfected for that purpose previously.

50. Putting the hands into pockets, using the handkerchief, etc., should be prohibited.

51. The operator and assistants should, if convenient, wear aprons, perfectly clean, and made of any goods, rubber, etc., and reaching from the neck almost to the ankles. This is for their own protection as well as that of the patient.

52. An apron is not a necessity and is not always convenient, and if the operator is, as he ought to be, cleanly in person, it does not make much difference.

53. In order to obtain an aseptic wound we must have, First—Perfect cleanliness of surfaces, with no infection from hands or instruments. Second—Perfect coaptation of surfaces. Third—Sutures strong enough and so placed as to prevent gaping. Fourth—Rest. Fifth—Position. Sixth—A certain amount of equable pressure. Seventh—An even temperature. Eighth—Dryness of wound surfaces. Ninth—Good drainage, including in this perfect absorption and disinfection of the discharges in the dressing. Tenth—An antiseptic dressing that will prevent entirely the ingress to, or contact of, the air laden with micro-organisms, or the causes of putrefactive changes, where they will find a nidus for growth.

54. After the sutures have been properly adjusted and cut, the incision should be dusted with iodoform or boracic acid, as much for their absorbent as antiseptic properties.

55. Bichloride or iodoform gauze should be used with profusion in dressing wounds, in order that the discharges may be perfectly absorbed and disinfected, and that ingress of air may be prevented.

56. In emergency cases, bismuth, freshly roasted, and ground coffee, finely pulverized; sawdust, medicated with carbolic acid or the bichloride; filter or blotting paper, soaked in a 2 per cent. solution of bichloride, may be used as dressings.

57. Salol, salicylic acid and hydrate of chloral, 2 grains to 1 ounce, make excellent antiseptic fluids when nothing else can be obtained.

58. Turpentine, something always at hand, can be used as an antiseptic by soaking the dressings in it. It prevents the flow of serum, and acts in that way.

59. Varick's method of applying heat is good. After the operation is completed, apply heat in the form of cloths soaked in boiling water to the wounded surfaces. This coagulates the albumen and practically forms an impermeable dressing itself. To succeed, the water must be boiling and close at hand, as heated or hot water is of no service. After the application the sutures are adjusted as wished.

60. Peroxide of hydrogen in deep fissures is an excellent antiseptic, oxidizing pus upon contact.

61. Never allow the nurse or other parties to touch the dressing, unless instructed by you. Many cases of suppuration in wounds occur in infection through curiosity on part of the patient, or meddling by the nurse.

62. Where union by first intention is desired, the dressing should not be removed until the seventh to tenth day, unless special indications arise; when, if you have observed proper care, you may expect to find union and everything in a sweet,

clean and aseptic condition. In many cases the first dressing is all that is required.

63. After operation upon a cavity it is well to wash it out with either a 5 per cent. solution of salt, or clean, recently-boiled water, to remove any excess of bichloride. In cases in which we have no antiseptics at hand, these will answer in douching, etc.

64. Under antiseptic precautions we do not fear to attack the brain and skull, the great danger heretofore being septic encephalitis, ostitis, etc.

65. Drainage from the brain may be accomplished either by tubes or else by making a counter-opening that will drain perfectly.

66. In scalp wounds always shave the head, scrub with a nail-brush and soap, remove all fatty matter with alcohol, ether, or turpentine, and then irrigate with a bichloride solution. Never examine the wound until you do this.

67. Loose fragments of bone should be placed in a 1-1000 bichloride solution until needed, and then, after having been perforated, should be sutured in place with cat-gut, leaving small spaces for drainage. Union will almost always take place, and we have advantage of having a long, instead of cicatricial, covering to the brain. If we fear to do this, mince the pieces up and dust on the surface of the dura mater.

68. In osteotomies, by the observance of strict asepsis, and then sealing the wound perfectly, we never have suppuration.

69. In compound fractures of bones, cleanse the wound of all dirt, spiculæ, etc., and irrigate with a 1-30 carbolic acid, or 1-2000 bichloride solution. Get the wound in position either by suture or adhesive strips, and dust with iodoform. Cover with iodoform or bichloride gauze, and put the part in an immovable dressing. If thus treated, these wounds seldom require any after attention.

70. Burns may be treated antiseptically as follows: As soon as possible after the injury, give the patient a hypodermic of morphia, and then put him under the influence of an anesthetic, cleanse the burn, and with a stiff brush, soap, and a bichloride or carbolic acid solution scrub thoroughly, after that irrigate it well and dust with iodoform or boracic acid. Dress with absorbent cotton, or with gauze, as you would any other form of wound. By this method you will have your patient fairly comfortable, or at least free from that excruciating pain common to extensive burns, in a few hours after the effect of the anesthetic has passed away. Shock is not so pronounced in these cases, and if treated properly it does not suppurate or slough.

71. In old, indolent ulcers, the best dressing is antipyrine. It stimulates the granulations, making them take on a new growth, keeps the surfaces perfectly dry, and aseptic, something nothing else will do, and the small amount which is absorbed improves the patient's general condition. Iodoform and boracic acid are also good, but do not act as well as antipyrine. The bandage may be applied according to the taste and skill of the surgeon.

72. In the bladder and urethra, the best way of rendering the mucous membrane aseptic is by a continuous stream of water, preventing in this way the lodgment of any germs. This irrigation should be repeated frequently during operations, or be continuous, if possible.

73. Instrumental infection of a healthy woman during a gynecological examinatiou is a danger to which many women have been sacrificed. Be particularly careful in asepsis in these cases.

74. Before making an examination the gynecologist should cleanse his hands as though he was going to perform an operation.

75. A carbolized vaseline, or one of the following ointments, are to be preferred as lubricants to lard or commercial vaseline.

76. Vaseline 30 parts, boric acid 4 parts; vaseline 120 parts, biniodide of mercury 1 part; vaseline 30 parts, iodoform finely powdered, iodol, salol or salicylic acid, 4 parts; vaseline 30 parts, creosote 1 part; olive oil 100 parts, carbolic acid 10 parts. Either of these make good antiseptic lubricants.

77. Instruments, specula, sounds, etc., should receive scrupulous care in cleansing, and should be immersed in a carbolic acid or bichloride solution.

78. The vagina should always be wiped out previous to examination with a wad of cotton soaked in a carbolic acid solution, and before an operation should be irrigated with the same fluid.

79. After operations the vagina should be irrigated thoroughly with carbolic acid, 1-30, and the wound surfaces dusted with iodoform; and then an antiseptic tampon should be introduced to absorb the discharges, but it should be removed early.

80. Boro-glyceride, 20 to 50 per cent., is an efficient antiseptic, and for use on tampons is to be preferred to anything else.

81. In the eye, calomel is the most efficient dry antiseptic we have, and may be used *ad libitum*. The fluid antiseptics may be the same as elsewhere, possibly a little weaker.

82. In gonorrhœa the oleum gaultheria internally, is of good service, being an antiseptic, and apparently having some specific action upon the gonococcus.

83. Irrigation with a 1-5000 to 1-20000 bichloride solution should be used in the treatment of gonorrhea.

84. In gonorrhea in women cleanse the vagina and vulva with a 1-1000 bichloride solution, and then rub the mucous membrane with a pledget of cotton soaked in a 1-100 solution of the same. This is to remove the superficial layer of the epithelium, which contains the gonnococcus. Dust the vagina and vulva with iodoform and pack the vagina with iodoform

gauze. This gauze is to be removed every four or five days and the vagina irrigated with a 1-2000 bichloride solution, and the gauze renewed. After the third or fourth removal, the gauze is omitted and the vagina irrigated every day for two weeks with a 1-2000 bichloride solution. This must be thoroughly carried out, and if so done is almost always successful.

85. In gonorrhoeal arthritis, after cleansing the surface properly, a trocar disinfected should be inserted and the fluid drawn off. The joint should then be irrigated with a 1-2000 bichloride, or 1-30 carbolic acid solution until the fluid returns free from blood or pus, close the puncture with iodoform or bichloride gauze and adhesive strips and in ten or twelve days begin passive motion.

86. In purulent otorrhea the ear should be washed out with a 1-1000 bichloride or 1-30 carbolic acid solution, and dried, and then idoform or boracic acid insufflated.

87. In preparing a room for operation, the floor and walls should be stripped of carpets, hangings, etc., and scrubbed with soap, brush, and a 1-500 bi-chloride solution. After drying, the windows and doors are closed tight and two to four pounds of sulphur ignited and left to burn. After airing the from will be almost aseptic, but if possible a coat of whitewash will assist. In many cases stripping the floors and walls and burning the sulphur will have to suffice.

The following tables give the names of some of the most prominent users of antiseptics and their preferences, and the germicidal power of various antiseptics:

TABLE I.

Surgeon.	Locality.	Antiseptics.
Mitchell Banks	Liverpool	Sublimate and carbolic acid spray.
Whitehead	Manchester.	Carbolic spray.
McEwen	Glasgow.	Strict antisepsis.
Ogster	Aberdeen	Carbolic acid.
Keith	Edinburgh	Carbolic acid.

Surgeon.	Locality.	Antiseptics.
Amandel	Edinburgh	Sublimate.
Péan	Paris	Sublimate.
Lücke	Strassburg	Sublimate.
Koeberlé	Strassburg	Alcoh. flame, boiled artificial sponges, carbolic acid.
Czerny	Heidelberg	Sublimate.
König	Göttingen	Sublimate and iodoform.
Volkmann	Halle	Sublimate and iodoform.
Gussenbauer	Prague	Sublimate.
Nussbaum	Munich	"
Weikel	Munich	"
Krönlein	Zurich	"
Kocher	Berne	"
Billroth	Vienna	Sublimate and iodoform.
Albert	Vienna	Sublimate and iodoform.
Gulliard	Geneva	Carbolic acid.
Terrier	Paris	Sublimate and carbolic acid.
Championnérre	Paris	Carbolic acid.
Bergmann	Berlin	Heat, sublimate, and iodoform,
Hohn	Berlin	Sublimate and iodoform.
Esmarch	Kiel	Iodoform.
Schede	Hamburg	Sublimate.
Wyeth	New York	Sublimate, iodoform and carbolic acid.
Weir	New York	Heat, sublimate, and iodoform.

TABLE II.

Antiseptic.	Strength.	Duration of Exposure to Kill Germ.
Corrosive sublimate	1-500	10 seconds.
" "	1-1,000	45 seconds.
" "	1-2,000	1 1-3 minutes.
" "	1-5,000	3 "
" "	1-10,000	5 "
" "	1-20,000	12–15 "
Biniode of Mercury	1-40,000	4 days.
Nitrate of Silver	1-10	4 seconds.
" " "	1-50	8 "
" " "	1-100	12 "
" " "	1-500	1 1-3 minutes.
Carbolic Acid	1-20	15 seconds.
" "	1-40	30-60 seconds.
" "	1-60	4 minutes.
Alcohol	No effect on dried germs; very powerful in moistened condition.	
"	95 per cent.	20–30 seconds.
"	66 per cent.	10–15 minutes.
"	absolute	4–12 seconds.
Salicylic Acid (make a stable solution)	1-60	1 minute.
Salicylic Acid	1-1,000	4-5 minutes.
Permangate of Potash	1-50	20 seconds.
" " "	1-100	1 minute.
" " "	1-200	5 minutes.
Chlorine water (unstable)		1 1-2 minutes.
Hydrogen Bromide (unstable)		1–1 1-2 minutes.
Boric Acid; no effect in ten days' exposure.		
Iodine to saturation; had no effect in 48 hours' exposure.		
Chloride of Zinc	1-20	No effect.
Oil of Turpentine		" "
Thymol		" "
Cucalyptol		" "
Iodoform; retarded growth after 48 hours only.		
Iodol, Bismuth and Boric acid, in powder, had no effect.		
Boiling water from 165.2° to 212° Fah., destroyed germs on contact as did dry heat at same temperature.		

ANNUAL ORATION.

By W. F. Hyer, M.D.,

Meridian, Miss.

Ex-President Mississippi State Medical Association, and Ex-President Tri-State Medical Association.

Ladies and Gentlemen, Mr. President and Fellows of the Association:

It being my duty on the present occasion to address this assembly on some subject of interest, both to the public and the medical profession, I have elected as the text to-night

The Relations which Do and Should Exist Between the Medical Profession and Their Clients, and the Duties which Each Owe to the Other.

This is a broad and suggestive theme, and to treat it in an exhaustive manner would require the labor of days instead of a few brief minutes; but when we view the subject aright, we find a few salient points standing out in bold relief, that are well worthy of a brief notice.

The relations between the client and physician are unique in their character in many respects, in that they cannot be found as existing between any other body of persons in the

world; with the exceptions in some respects of those between the pastor and his members.

I. *They are more constant.*

Outside of suits involving the rights of property, the professional intercourse of the lawyer and his client is but seldom exercised, and in those cases where life or liberty is at stake the confidential relations rarely extend beyond the range of the two mentioned.

As regards the relation of the public with the ministers of the gospel; as a general thing they are perfunctory, and consist of an occasional visit of the pastor to the family of the church member, a general inquiry into their spiritual condition, a chapter read in the Bible and an offering of a prayer for their continuous welfare, both spiritual and temporal.

This, as a general thing, is only varied when the angel of death has entered the household, and hovers for a brief period over the bed of the afflicted one ere he wafts him into the great beyond to meet his God. Of course at this supreme moment a relationship is established, which, however soon is sundered, to be only again renewed when similar circumstances arise.

But the professional intercourse between the physician and his patient is a matter of common occurrence, and the necessarily confidential relations extend to every member of the family. They are constant, because man is mortal—an intricate machine which is constantly in need of repair. The changes of seasons, the inclemency of the weather, exposure of the person to noxious draughts, excesses in the indulgence of the appetite, impurities in drinking-water, unwholesome and adulterated food, all tend to derange the physical system and demand the frequent ministrations of the faithful physician; and for these reasons the relations are more constant between the physician and his patient than between any other two classes of men.

II. *The relations are more confidential.*

The physician, in his intercourse with his patient, is necessarily brought, as it were, into the bosom of the family. He knows each member by name. He is present in every critical emergency involving the health or life of any of its members. Be there family jars, he soon feels the friction. Is there a skeleton in the family closet, he soon discovers its presence. Are financial embarrassments hovering in the air, or does calamity spread its dark wings above them, he is the first to whom the fact is confided, and his counsel the first that is sought. He is looked upon in the light of a dear friend, and one on whose strong arm they may confidently lean. He soon learns the ways of the household, and feels, and is regarded almost as a member of the family. He visits them at day or night. He soon learns the way to the pantry when he desires food, and makes his pallet down by the fire in the invalid chamber where he may catch cat-naps; while from time to time he arises to examine the condition of the patient and watch for a critical moment, when he can act with decision and success. Ideas of persons and things freely ventilated, and discussions of family affairs in his presence, are of every-day occurrence, and do family embarrassments arise, he is the first one called in to council.

III. *His relations to his client are responsible*, more so than those either of the lawyer or minister.

It is true that it is the duty of the minister to try and save the soul, but in doing this his suggestions are limited by the creed of his church and the Holy Gospel. Does he teach false doctrines, his church disciplines him; and the Christian sufferer realizes whether or not his suggestions and teachings are in accordance with holy writ.

In respect to the lawyer, if mistakes are made, and a miscarriage of justice is threatened, the right of appeal lies; but from the action of the physician there lies no appeal—his action is final. The fight is with death. According to his

knowledge, learning and ability, the arbitration is frequently made.

As a natural result of the frequent exercise of these relations there arises

IV. *An affectionate relation;* not the affection of kinship; but the affection which exists among tried and trusty comrades, who have done battle together shoulder to shoulder, and back to back; who, relying on the aid of each other, have picked their way through constant danger, and, to use a common expression, have not yet "got out of the woods."

These relations therefore existing, entail certain duties on both parties. Duties on the part of the client, and duties on the part of the physician; and as a general thing the duties on the part of the physician are much more thoroughly performed than those on the part of the patient.

I. The greatest duty on the part of the patient, is to select for his adviser an honest, conscientious, and competent physician. This duty the client owes to himself more than to his physician, for unless the physician possess these qualities the client must suffer. This proposition needs no argument for its demonstration.

II. Another duty on the part of the client is, when he consults his physician, to put himself unreservedly in his hands and not embarrass him in his proceedings by telling how he wants the case treated, or by telling him what medicines he will not take. The physician is responsible to the patient, and to himself for the way he handles a case. This duty, however, will not prevent the patient from informing the physician concerning any idiosyncracies, or constitutional peculiarities concerning the action of certain medicines which may have been demonstrated in the case in hand in prior illness; but having stated these peculiarities to the physician, allow him to administer his remedies according to his judgment.

When a vessel comes into port the pilot is called, and the ship lays-to outside the bar until he steps on board. The captain then resigns the management of the ship entirely, and surrenders all responsibility for the safety of vessel, cargo, and passengers into his hands, and retires into his cabin, or saunters about the deck with his passengers. What would be thought of the captain who would tell the pilot that he did not desire to enter the harbor on the starboard, or port tack, or that he did not desire his vessel to enter through a certain channel, or on the ebb, or flow of the tide. He may inform the pilot of how the vessel answers the helm, and how much water she draws; beyond that he should not attempt to meddle, otherwise he would be considered a fool. The pilot is responsible for the navigation of the vessel through the intricacies of the channel, into the safe harbor, even as the physician is responsible for the guidance of the patient through the intricate mazes of disease, into the safe harbor of health.

When a physician takes charge of a case it is *his* case, and not the patient's. If you don't like the way your doctor treats your case, call a consultation; that is your right and duty, or discharge him and employ another, but *don't meddle.*

There is a third and most important duty on the part of the client to the physician, which is but seldom performed in a proper manner, and that is when the case is ended or when the bill is rendered to *pay*—pay liberally, pay willingly, pay ungrudgingly. Recollect that your doctor has stood by you, not while the sun was shining brightly, and the trade-winds of prosperity were wafting you pleasantly along; but in the dark night of affliction, and while the storms of adversity held you at their mercy, and the billows of despair were about to overwhelm your soul. Recollect who was your trusted pilot on that occasion; on whose strong arm and trained intellect you leaned; into whose ears you poured words of undying gratitude when he restored your darling child or cherished wife again to your loving arms. Don't make him feel mean and like a beggar when you come to a settlement, but show by

your actions that your gratitude was not a pretense, or as evanescent as the passing clouds.

But the duties and obligations of the physician to his clients and to the public are equally if not more imperative.

1. He must be a close student of human nature, for on his proficiency as such, much of his success will depend. God did not make all men in the same mould, and the characters with whom the physician is daily thrown in contact are as varied as the colors of the rainbow, and as diversified as the flowers in the garden. No two men are alike, and the physician who can the most perfectly fathom and analyze the peculiar characteristics of the individual, occupies a more favorable vantage ground in treating his ailments, than he who is wanting in these qualities. The mind frequently rules matter, and we cannot deal with the hypochondriac, as we would with the enthusiast.

2. The next quality which the physician must cultivate is discretion. He must be discreet, that he may provoke no scandal. The opportunities of the physician are such that his bosom is generally the repository of the secrets and scandals of the neighborhood, and did he give his tongue free sway, it would not be long before the neighborhood would be by the ears, fighting like dogs and cats. A doctor must learn how *not* to talk, for in some unguarded moment he might express an opinion concerning a patient, in confidence or otherwise, to some garrulous person, which in passing from mouth to mouth would be so distorted, and obnoxious, as to keep him vainly explaining for many months or perhaps years. In fact, a doctor should never allow the condition of a patient to become the subject of a conversation to which he is a party, for in doing so he is violating the confidence of his patient, who employed him to treat him, and not to babble about him.

3. The true physician must cultivate the faculty of masking his emotions, and make his countenance an unreadable

book. This he must do in justice to his patient, for nothing so strongly militates against the recovery of a very sick person, as a knowledge of the uneasiness or fear of a fatal result on the part of a physician. Hope is a great stimulant and sustainer of the vital forces, while they sometimes quickly fail under the unfavorable influences of fear and despair. The physician must also cultivate the faculties of moral courage, and self-reliance, in order that he may be ready to meet any emergency, and not be the slave of his emotions. There are many physicians wanting in these qualities. They know what an emergency requires; they know that if the remedy is not applied disaster will follow; but they are slaves to their emotions, and moral cowards in the presence of responsibility, and as a salve to their uneasy consciences they fall back on the *vis medicatrix naturae* and exclaim: "Let nature take its course," hoping against hope, that something may happen in the great chapter of accidents, to relieve them of the responsibility that they have guiltily assumed, and when death steps in to his relief he exclaims: "'Twas nature killed him and not the doctor."

Last but not least the physician, as one of his duties, must cultivate habits of diligence in the pursuit of knowledge. He must be diligent, that he may prepare himself for, and at a moment's notice be ready to meet the responsibilities incident to his profession. The minister of the gospel has always a week's time in which to prepare his sermons for the morning and evening service, with the advantage of the possession of a lot of old reliable sermons to fall back on in a time of need. The lawyer has always time to take down his digest and refer to all the supreme court decisions bearing on the case in hand, and to prepare himself for the legal struggle; but the physician frequently finds himself face to face with an emergency that will not admit of a moment's delay, if the life of the patient is to be saved; no time for consultation, no time to consult the authorities, far away perhaps from professional aid; act he must on the spur of the moment with energy, decision, and knowledge.

He must be diligent also, that he may be enabled to master the principles of his profession; for in its scope it is broad as the universe, and the mind of no individual can comprehend its mysteries in all its branches. The deeper he dives into them, the more he acknowledges the wisdom of God, and the insignificance of man. Without diligence he will be wanting in power of diagnosis, and knowledge of remedial agents.

The true physician is always diligent in the search for knowledge. He utilizes every means at hand for its attainment. He burns the midnight oil. He attends associations where he may meet with his brethren, and brighten his intellect, and sharpen his faculties by the friction of mind against mind, while discussing subjects of interest to the profession. For this object the Southern Surgical and Gynecological Association was organized; for this purpose are we assembled in Birmingham to-day. The Southern physician in every State has his association with which he may affiliate, but there has for a long time been recognized the need of an association for the advancement especially of the branches of medical science, known as surgery, and gynecology. These associations are common in the more thickly settled Northern States, but in the South we have felt their needs. It is right that such an association should be formed in the South, for in the South was the birth-place of the science of surgical gynecology. 'Twas here it was nurtured, and here it grew to its full and perfect proportions of maturity. Thirty years ago there was no science of surgical gynecology; the world was barren of all knowledge of the surgical treatment of diseases peculiar to women. It was known that such diseases did exist, but as to their remedy all was blank. They had learned to suffer in silence, without hope of relief, but about the time I have mentioned a Southern man, a native of South Carolina, and resident of Alabama, was devoting the entire energies of his mind to the solution of the problem, and he published his observations to the world. The postulates he laid down, the ideas to which he gave utterance, the conclusions that he formed, the remedies that he suggested at that

time, are accepted to-day as the gospel of gynecology. The edifice that he reared stands to-day without alteration, except, perhaps, a few embellishments have been added. His ideas of abdominal surgery govern the practice to-day. His name was MARION SIMS, a man honored in the hovel of the poor, the residence of the rich, the palaces of king and emperors; a name that will go down to remote posterity coupled with those of the great benefactors of humanity. He went down to his grave accompanied by the prayers and benedictions of women in every part of the civilized world. The Woman's Hospital in New York, which was built by the rich women of that city through his earnest labors, stands a monument to his humanity and science, while the monument erected to his memory by the women of the United States, will keep in remembrance the love and appreciation borne by them, for his distinguished attributes.

Since the days of Sims the advancement and perfection of gynecological science has generally been the result of the labors of the Southern physician, and to-day the foremost gynecologists in the United States are Southern born, and Southern reared. Thomas, Polk, Wylie, Battey, Bozeman, are prominent illustrations of the proposition, and as eager followers in their footsteps we have assembled ourselves together in the organization of the Southern Surgical and Gynecological Association.

May its career be prosperous and tend at all times to lift the profession in the South to a higher plane of usefulness.